ANNUAL REPORT

OF THE

Department of Lands and Mines

OF THE

PROVINCE OF ALBERTA

FOR THE

Fiscal Year Ended March 31st 1935

PUBLISHED BY ORDER OF THE LEGISLATIVE ASSEMBLY

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1936

To the Honourable W. L. Walsh,
Lieutenant-Governor of the Province of Alberta.

SIR:

I have the honour to submit herewith the report of the Department of Lands and Mines for the fiscal year ended March 31st, 1935.

I have the honour to be, Sir,

Your obedient servant,

CHARLES C. ROSS,
Minister of Lands and Mines.

EDMONTON, December 13th, 1935.

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CHIEF OFFICERS,

DEPARTMENT OF LANDS AND MINES

March 31st, 1935

Honourable Hugh W. Allen ..... *Minister of Lands and Mines*

John Harvie ..... *Deputy Minister of Lands and Mines*

T. C. Rankine ..... *Departmental Solicitor*

D. H. Boles ..... *Director of Lands*

W. Calder ..... *Director of Petroleum and Natural Gas*

T. F. Blefgen ..... *Director of Forestry*

J. A. Hutchison ..... *Assistant Director of Forestry*

R. T. Rodd ..... *Director of Fisheries*

A. A. Millar ..... *Chief Inspector, The Coal-mines Regulation Act*

I. N. McKinnon ..... *Chief Accountant*

J. W. Stafford ..... *Agent, Edmonton Land Agency*

M. Gossip ..... *Agent, Calgary Land Agency*

R. Cruickshank ..... *Agent, Lethbridge Land Agency*

J. J. E. Clarke ..... *Agent, Peace River Land Agency*

R. J. Dean ..... *Inspector of Revenue*

F. W. Neilson ..... *Chief Timber Inspector*

T. W. Dalkin ..... *Technical Division*

J. L. Irwin ..... *Statistician*

REPORT

OF THE

Department of Lands and Mines

1934-35

Honourable Charles C. Ross,
Minister of Lands and Mines,
Edmonton.

SIR:

I have the honour to submit the fifth Annual Report of the Department of Lands and Mines for the fiscal year ended March 31st, 1935.

Before giving a résumé of our activities, may I digress to refer to the report of the Royal Commission on the Natural Resources of Alberta under the chairmanship of the Honourable Andrew K. Dysart, Judge of the Court of King's Bench, Manitoba, transmitted the 12th of March, 1935, to the Right Honourable R. B. Bennett, Prime Minister of Canada.

The Commission was instructed to ascertain what consideration should be paid to the Province, in addition to the sums provided in Paragraph 20 of the Natural Resources Agreement, in order that Alberta may be placed in a position of equality with the other Provinces of Confederation with respect to the administration and control of its natural resources as from its entrance into Confederation in 1905.

The Department wishes to express its appreciation to M. M. Porter, K.C., of Calgary, for the excellent way in which the case for the Province was presented. Throughout the whole of the proceedings Counsel for the Province emphasized to the Commissioners that he was there to help them in their many ramifications.

Aside from the large amount of data furnished by the Province as well as the Dominion, Counsel was faced with the necessity of conducting a minute research into the historical background of Confederation and his presentation of the Province's case reveals how thoroughly and efficiently such investigation was conducted.

Our appreciation is likewise extended to James J. Frawley, K.C., Solicitor of the Attorney-General's Department of the Alberta Government, for his long hours of intensive research and compilation of data on a great variety of subjects, and to James C. Thompson, C.A., Provincial Auditor, Province of Alberta, for his valuable assistance in an advisory capacity in all matters relating to finance.

TWO ROYAL COMMISSIONS

As requested by the Legislature, a Commission under the chairmanship of the Honourable Albert Freeman Ewing, a Judge of the Supreme Court of Alberta, was established to enquire into the problems of health, education and general welfare of the Half-breed population of Alberta. Negotiations are also pro-

ceeding for a Commission to investigate the coal mining industry of Alberta and it is anticipated that the Enquiry will be held at an early date.

Department's Increased Revenue and Production, 1934-35

The favourable change in last year's economic situation, emphasized in the previous Annual Report, was enhanced throughout the period now under review, presenting as a result a healthy and gratifying outlook in the history of the Department's progress.

Surplus on income account shows once more an increase, which amounts this year to $171,840.78 over the previous total. Revenue was increased by $232,400.35 and whilst there was an increase in expenditure of $60,559.57, a departmental surplus of $646,528.97 is nevertheless revealed which compares most favourably with last year's surplus of $474,688.19.

Improvements in the general situation are demonstrated by other increases, which are as follows: petroleum production, 105,485 barrels; natural gas consumption, 253,683,000 cubic feet; timber revenue, net increase, $71,244.39; commercial fish production, 493,080 pounds with value of increase to fishermen, $14,065.19 and value as marketed, $43,315.53.

Coal produced in the province during the calendar year showed an increase of 34,064 tons. Coke production increased by 10,424 tons but a slight decrease of 198 tons took place in the output of briquettes.

Additional electrical power, increased by 1,835,662 k.w.hrs., was used in the operation of Alberta coal-mines during the calendar year.

Shale mined for this period increased by 10,327 tons with corresponding increases in the number of bricks manufactured which totalled 3,176,972 and of 1,171 tons in the manufacture of tiles.

Report of the Royal Commission on the Natural Resources of Alberta

The Report of the Royal Commission on the Natural Resources of Alberta, which materialized during the period under review, was an event of first importance not only to this Department but also to the Alberta Government.

The function of this Commission was specifically one of arbitration with regard to whether any, and, if any, what consideration, in addition to the sums provided in Paragraph 20 of the Natural Resources Agreement (Statutes of Canada, Ch. 3, 1930) should be paid to the Province in order that Alberta, as previously mentioned, may be placed in a position of equality with the other Provinces of Confederation with respect to the administration and control of its natural resources as from its entrance into Confederation in 1905.

Authorization by Order in Council.—The Commission on the Natural Resources of Alberta was created pursuant to authorization contained in Order in Council, P.C. No. 1588 of July 19th, 1934.

Personnel.—The commissioners appointed were as follows:

The Honourable Andrew K. Dysart, Judge of the Court of King's Bench, Manitoba, Chairman;

George C. McDonald, Esq., Chartered Accountant, Montreal;

Oliver Master, Esq., Chief, Economics Division, Department of Trade and Commerce, Ottawa, Secretary.

Counsel appearing before the Commission for the Dominion of Canada were:
James McGregor Stewart, K.C., Halifax;
C. P. Plaxton, K.C., Senior Advisory Counsel of the Department of Justice, Ottawa.

Counsel appearing before the Commission for the Province of Alberta were:
M. M. Porter, K.C., Calgary;
James J. Frawley, K.C., Solicitor of the Attorney-General's Department, Government of Alberta.

Assisting at the hearings and elsewhere were responsible officials of several Departments of the Dominion and Provincial Governments.

Published Verbatim Reports of the Proceedings before the Commission.—The verbatim Report of the entire proceedings before the Commission has been published in typewritten form in three bound volumes.

Public Sittings.—Public sittings for the reception of evidence and argument were held at Ottawa where, because of the accessibility of records, the convenience of all parties was best served.

Following a preliminary meeting on August 14th, hearings were divided into several periods, which were as follows—October 2nd and 3rd, October 16th to 19th inclusive, November 21st and 23rd, December 4th to 8th inclusive, and December 11th.

The sittings, it will be observed, ranged themselves into several groups, separated from one another by intervals of varying duration. These intervals were required for investigating sources of information and for securing and preparing evidence as the same was requisitioned from time to time during the progress of the Enquiry and as issues emerged and took definite form. The task of procuring and compiling the vast and varied amount of needed information was one of great magnitude and demanded the services of a considerable number of departmental officials for many weeks.

Evidence.—Evidence to be presented before the Commission was divided between statements of Counsel and documentary material. The latter comprised over 250 exhibits covering a wide range of subjects which included maps and graphs, copies of Orders in Council, extracts from public documents, quotations from the public utterances of public men, synopses and analyses of records and complicated tabulations of data.

Expression of Appreciation to the Staff of this Department.—This documentary material was voluminous in size and significant enough with regard to the information it contained to make it the most important part of all the evidence which was submitted.

Its preparation represented a long and most arduous undertaking, which had necessitated considerable overtime on the part of every member of the headquarters' staff of this Department. As a result of this most praiseworthy co-operation, the much needed and extremely satisfactory results, after a period of practically six months, were made possible.

Individually and collectively this co-operation was willingly and efficiently given and I would like to express my very great appreciation for this loyal and most valuable assistance.

Similarity to Saskatchewan Report.—It should be stated that this Report in many sections follows closely, if not identically, the text of the Report of the Royal Commission on the Natural Resources of Saskatchewan. This Enquiry,

which began when the hearings in the Saskatchewan Enquiry had been completed, had to deal with problems closely paralleling those of Saskatchewan, both in respect to historical background and practical difficulties, and has been conducted by three Commissioners of whom two were members of the Saskatchewan Commission. The work of the two Commissions, in the latter stages, was carried on concurrently and the Reports, though separate, covered much common ground in the same or closely similar terms.

Report of the Commission.—The Report of the Royal Commission on the Natural Resources of Alberta, following the submission of all evidence, was published, both in typewritten form in bound volume and in printed form as a Government publication, on March 12th, 1935, upon which date it was presented to the Prime Minister of Canada by the Honourable A. K. Dysart, Chairman of the Commission.

The Report opens with a copy of the letter of presentation to the Prime Minister followed by a copy of the Order in Council, P.C. 1588, July 19th, 1934, which authorized the creation of the Commission. The body of the Report is divided into nine brief chapters concluding with a note by Mr. Commissioner McDonald.

The chapters deal with the following subjects:

Chapter

I. Introductory
II. Control of Natural Resources in Canada
III. The Dominion's control of Natural Resources
IV. The Attitude of the Prairie Provinces
V. The Reference: its Scope and Intent
VI. Alberta's Claims—General Observations
VII. The Claims considered
VIII. Credits claimed by the Dominion
IX. Conclusions and Recommendations

Note by Mr. Commissioner McDonald

Recommendations.—The Commissioners' Recommendation is contained in the last chapter of the Report on page 38. In this section the sum mentioned, which it considers should be paid to the Province of Alberta by the Dominion Government, is $5,000,000. It was also proposed that this sum should bear interest at the rate of five per cent per annum from October 1st, 1930 to March 31st, 1935 and thereafter to such date and at such rate as the two Governments may agree upon. Furthermore, it was recommended that no portion of this sum should be considered as belonging to the Alberta School Lands Fund and also that it should include all sums payable by the Dominion in respect of townsites, mentioned in paragraph 81 of the Report, and other minor adjustments.

The sum of money involved in this recommendation was determined upon as the result of compromise and agreement as to the amount but not by agreement as to the method of calculation, the arithmetic of the case presenting too many variables for two persons to reach a common result in precisely or even closely similar manner. With a given agreement upon the result it was deemed unnecessary to set out individual viewpoints as to the different ways in which the Dominion and Provincial Credits should be respectively compiled. This, it was stated, would open up a problem lending itself to endless variation and consequently to endless controversy.

Provincial Lands Administration

School Lands' Purchasers.—The relief measure crediting an extra dollar for every dollar paid in arrears or current interest, referred to in the previous Annual Report, which was introduced for the benefit of school lands' purchasers, was continued in force during this period under review.

Trend of Settlement.—The decrease of 926 in the general total of first and second homestead entries and soldier grants, as shown in the following statement, is due to the same reason as given in the previous Report, namely, hard times and lack of capital to enable settlers moving their families, goods and chattels into the available areas in the northern portion of the province.

Trend of settlement as in the previous year continued in the direction of Drayton Valley, south of Evansburg. A considerable number of homestead entries were also granted in the Bonnyville area.

Homestead Entries.—First and second homestead entries and soldier grants during the year totalled 2,780 covering an area of approximately 444,800 acres as compared with 3,706 representing an approximate acreage of 592,960 for the previous fiscal year.

Comparative statement showing totals of homestead entries and soldier grants from 1930-31 to 1934-35 follows. Fuller details of this information appear in the land agents' and Chief Accountant's section of this Report and in similar sections of the Annual Reports of preceding years.

HOMESTEAD ENTRIES GRANTED

Fiscal Year	Homesteads	Second Homesteads	Soldier Grants	Total	Homesteads Granted to Women
*1930-31	3,042	557	149	3,748	.....
1931-32	3,876	522	30	4,428	1,521
1932-33	3,112	358	29	3,499	976
1933-34	2,984	696	26	3,706	1,011
1934-35	2,425	325	30	2,780	835
Totals	15,439	2,458	264	18,161	4,343
This year in comparison with last	Decrease 559	Decrease 371	Increase 4	Decrease 926	Decrease 176

NOTE.—Homesteads for women were not available until 1932. The total number of women's homesteads as shown in the above statement is included in the first homestead total.

Work of the Technical Division

Issue of Notifications.—The following comparative statement shows the number of notifications and acreage covered thereby for the fiscal years from 1930-31 to 1934-35:—

NOTIFICATIONS ISSUED

Fiscal Year	Number of Notifications	Area, Acres
*1930-31	23	3,019.71
1931-32	784	111,424.478
1932-33	1,260	178,887.233
1933-34	1,106	165,224.553
1934-35	1,915	324,611.398
Totals	5,088	783,167.372
Increases this year in comparison with last	809	159,386.845

The above statement reveals a considerable increase both in the number of notifications issued and in the acreage they cover for the year under review.

Amongst special grants issued the most important was one representing an area covering approximately 40,550 acres located in the forest reserve south of

*Six months to March 21.

Kananaskis, now known as the Kananaskis Forest Experiment Station. This was issued to the Dominion Government, the Province of Alberta reserving all mineral rights. The purpose of the transfer had for its objective the carrying out of scientific work in sylviculture with investigation of other phases of forestry such as protection, mensuration and the effects of forests on stream flow and watersheds.

Canmore Townsite.—A change of policy was effected regarding lots originally leased by the Dominion in the Canmore Townsite, when it was considered expedient to sell such lots to the leaseholders. Ninety were disposed of which were covered by eighty-eight notifications.

Work of the Royal Commission.—For a period of practically two months the staff of the Division, with additional help, was engaged in preparing maps, graphs, charts, schedules and statistics in connection with the presentation of the Province's claim against the Dominion for the alienation of the natural resources.

Maps.—Distribution was made to the Land Agencies of 3,000 copies of the new issue of the Lethbridge-Calgary Agency Map. An order for 4,000 copies of a new map for the Edmonton Land Agency was placed with the Dominion Government at Ottawa. During the year the Division collaborated with the Surveyor-General's office at Ottawa for the issue of two maps of the Province of Alberta on scales of thirty-five miles and sixteen miles to the inch.

Maps, plans, sketches and graphs were draughted covering a variety of subjects for the use of the Department and the general public. These included plans for the Half-breed Commission, bituminous sand areas in the north and Alberta oil fields. Engrossing work covering the Speech from the Throne and work of a similar nature was also carried out.

GRAZING

The number of requests received for the inspection of grazing applications, the number reported on and the miles travelled to make investigations and inspections for the fiscal year ended March 31st, 1935, were as follows:—

Requests to inspect applications	211
Requests to inspect renewal applications	209
Total	420
Applications reported on	97
Renewal applications reported on	61
Special Reports	9
Supplementary Reports	16
Reports covering Stock Watering Reserves	11
Reports covering Public Grazing Reserves	2
Total	196

MILEAGE

Automobile	3,318
Train	800
Total	4,118

No inspections or investigations were made from July 4th, 1934 to April 30th, 1935.

APPLICATIONS AND RENEWALS FOR GRAZING LANDS

Fiscal Year	
1931-32	741
1932-33	259
1933-34	393
1934-35	420
Total	1,813
Increase this year in comparison with last	27

Petroleum and Natural Gas

Effects of economic depression were still in evidence throughout the year regarding petroleum development and no discoveries of any importance materialized. Small increases, however, were shown in the totals given for oil production and natural gas consumption.

Development Areas.—The greatest drilling activity, as in previous years, took place in Turner Valley with sections 21 and 28 of township 18, range 2, west of the 5th meridian standing out as the centre of development.

In addition to this continued exploration, test wells were drilled in the following areas:—Highwood, the Watson structure near Lundbreck, Cardston, Del Bonita and Twin River, details of which are given in the Petroleum and Natural Gas Division's section of this Report.

New drilling was carried out in the Red Coulee district close to the producing wells. Unfortunately, after a very short and inconclusive test, this was abandoned without any effort being made to break up the sand formation by explosives or other known means used for creating the inflow of oil. Another well is under preparation and it is hoped that the operator will make every effort to thoroughly test all sands which may be encountered in the process of drilling.

A review of the oil well situations as they exist at the present time in Aldersyde, Olds, Brosseau and Athabasca is also made by the Division in their section of this Report.

Well Pressures.—All wells in the Turner Valley field were tested for volume and pressure between August 20th and September 2nd in continuance with the practice of other years.

Maximum pressure wells showed a decline for the year amounting to 185 pounds as compared with wells demonstrating lowest pressures where the loss was only 80 pounds. Based on the total operating days and the total pressures of all wells, the average pressure decline per day for the whole field was .35 pounds per square inch.

An unjustifiable decline in well pressures took place in section 28, township 18, range 2, west of the 5th meridian, the area in which, as already stated, drilling activity in Turner Valley was chiefly centred during this period. The decline was due of course to the intensity of operations in this section which resulted in the obvious fact that an excessive number of wells had been drilled in this particular area. The majority of operators are however not appreciative of the fact that the best naphtha recoveries can only be secured by the maintenance of high back pressures on wells and also that if section 28 had not been operated under quota withdrawals, as set by the Division, the decline in pressure would have been considerably more rapid.

Absorption Plants.—A second absorption plant was constructed on section 4, township 19, range 2, west of the 5th meridian towards the close of the year and a third was projected on the adjoining section 33 in township 18. With these new plants in operation a still greater reduction will result in the wastage of gas thereby extending the period before exhaustion very considerably. This period has been variously forecasted and by now would have been near to an end had not the Provincial Government taken the initiative with regard to its control.

Control of Production by Purchase.—The acquiring by major operating interests of the control by purchase from independent operators of the majority of limestone producing wells constituted an outstanding feature in the Turner

Valley development during the year. By this transaction all naphtha-carrying gas from the transferred wells became available for processing by absorption. So much of the gas volume was released by this arrangement that it exceeded the capacity of the original absorption plant making it necessary for several of the wells to be completely closed in.

The transfer in most cases applied only to production from the limestone, the original owners retaining the right to develop the crude oil horizons present in the overlying formations. The retention of these rights may now act as an incentive for independent operators to concentrate their efforts on crude oil production which can be obtained at a cost per well considerably below the cost per well in drilling to the limestone.

Bow Island Gas Field.—Although the question of gas conservation had for a long while been considered a very important factor towards industrial efficiency in Turner Valley, it was not until 1929 that the first steps were taken to put it into practice.

The operators of the nearby depleted Bow Island gas field then made application to the Dominion Government to have that area classed as a gas repressuring reservation comprised of certain sections in townships 10 and 12, ranges 11 and 12, west of the 4th meridian, such areas to be restricted from mineral leasing.

This application was duly granted under P.C. No. 935, dated May 3rd, 1930, and operations in this particular area for rehabilitating certain wells and the abandonment of others were started at once together with the construction of the necessary repressuring mechanical equipment.

Following this, operations were started within the same year for repressuring the depleted wells and the plant has worked satisfactorily to date. At the end of December, 1934, a total of 7,259,415,000 cubic feet of gas had been forced into the sands resulting in an increased well pressure which rose from 248 pounds to 480 pounds per square inch.

Though the practice of injecting gas into depleted oil and gas sands is not a new one, these operations represented the first attempt ever made in Canada in this respect. Those responsible for this effort are to be commended not only for preventing a small portion of the Turner Valley wastage of gas but also for creating a reserve which, though at present insignificant, will eventually represent a consdierable quantity of gas for future requirements.

The repressuring equipment having worked satisfactorily to date and having apparently given an efficiency greater than the manufacturers' specifications, it is to be hoped that the plant's capacity will be considerably increased in the near future.

Medicine Hat Gas Field.—Confirmation of the satisfactory conditions reported for 1933 by the City of Medicine Hat in the Annual Report of their gas wells was obtained in 1934 by tests supervised by the Divisional staff.

Further slight increases at certain wells in the central area were noted and prove convincingly that the rehabilitation and other work done at the Medicine Hat and Redcliff old wells was timely and fully justified. This also supplies proof that formerly there must have been a considerable wastage of gas underground on account of leakage from defective well casings and distributing pipes.

Exhibits.—At the close of the Petroleum and Natural Gas Division's section of this Report the following exhibits appear:—

EXHIBIT A.—Statistical information covering oil production, analyses of Alberta oils, oil producing wells, gas wells, footage drilled, oil imports to Alberta, gas consumption and value, analyses of natural gas, gas repressuring—Bow Island field, gas well pressures, estimate of withdrawals and waste of gas at Turner Valley wells, Divisional inspection of wells and Divisional geological examinations of well samples;

EXHIBIT B.—"Metering of gas wells", by J. G. Spratt, Divisional Engineer, Petroleum and Natural Gas Division;

EXHIBIT C.—"Turner Valley drilling practice," by Vernon Taylor, Assistant Engineer, Petroleum and Natural Gas Division;

EXHIBIT D.—"Natural gas in Alberta," by F. K. Beach, Office Engineer, Petroleum and Natural Gas Division;

EXHIBIT E.—"Wainwright oil field," by R. M. S. Owen, Assistant Engineer, Petroleum and Natural Gas Division.

PETROLEUM PRODUCTION

Fiscal Year	Naphtha (Barrels)	Light Crude Oil (Barrels)	Heavy Crude Oil (Barrels)	Total (Barrels)
*1930-31	1,496,457	104,183	13,562	1,614,202
1931-32	1,143,875	86,000	16,453	1,246,328
1932-33	810,958	52,238	7,886	871,082
1933-34	1,082,816	54,048	4,609	1,141,473
1934-35	1,192,226	40,346	14,386	1,246,958
Totals	5,726,332	336,815	56,896	6,120,043
	Increase	Decrease	Increase	Increase
This year in comparison with last	109,410	13,702	9,777	105,485

*Under federal administration to October 1st, 1930, and under provincial following that date.

Increased Production, Heavy Crude Oil.—It will be noted from the above statement that the production of heavy crude oil shows an increase of nearly 10,000 barrels as compared with a production decrease of over 3,000 barrels in the preceding year. This is attributable to the erection of the Gold Standard Refineries in Wainwirght which was constructed during the period under review and which established a home market for the oil operators in this area. The plant was able to absorb the entire production of the field together with considerable imports of crude oil. Distillates, principally purchased locally by farmers, together with gasoline in smaller quantities, constituted the products of the new refinery.

NATURAL GAS CONSUMPTION

Fiscal Year	Cubic Feet
*1929-30	23,228,637,000
†1930-31	23,312,006,000
1931-32	18,327,139,000
1932-33	16,061,383,000
1933-34	16,346,376,000
1934-35	16,600,059,000
Total	113,875,600,000
Increase this year in comparison with last	253,683,000

*Under federal administration.
†Under federal administration to October 1st, 1930 and under provincial following that date.

Valuations of Petroleum Production and Natural Gas Consumption.—Valuations of naphtha production for the year together with that of light and heavy crude oil and also valuation of natural gas consumption are given in Exhibit A of the Petroleum and Natural Gas Division's section of this Report.

Forest Service

Fire Season.—Precipitation over most of the Province was lighter than usual during the spring of 1934. At this period of the year there were 144 fires which represented 60% of the total for the year. June rains terminated this danger period over all forested territory excepting in the south where rain-fall was insignificant and far from adequate in the matter of forest protection.

A summary of fire losses within and outside Alberta forest reserves from October 1st, 1930 to December 31st, 1934 is given on the next page.

SUMMARY OF FIRE LOSSES WITHIN ALBERTA FOREST RESERVES

Period	Number of Fires	Cost of Suppression	Area (Acres)	Salvable Timber *M.f.b.m.	Salvable Timber (Cords)	Unsalvable Timber *M.f.b.m.	Unsalvable Timber (Cords)	Total Loss
October 1, 1930 to March 31, 1931	9	$ 551.67	41.925	.....	.....	2.00	129.00	$ 71.69
April 1, 1931 to December 31, 1931	31	17,624.12	52,218.05	2,370.5	3,086	6,295.73	111,599.00	154,651.47
January 1, 1932 to December 31, 1932	32	3,491.04	2,555.75	8.00	15,863	3,845.00	1,005.60	8,790.73
JJanuary 1, 1933 to December 31, 1933	39	18,409.92	29,275.88	26.75	1,201	19,188.25	108,414.00	95,796.93
January 1, 1934 to December 31, 1934	47	31,118.51	21,963.00	1,510.00	9,200	2,661.00	209,550.00	96,195.87
TOTALS	158	$71,195.26	106,054.605	3,915.25	29,350	31,991.98	430,697.60	$355,506.69

SUMMARY OF FIRE LOSSES OUTSIDE ALBERTA FOREST RESERVES

October 1, 1930 to March 31, 1931	47	$ 686.64	11,145.19	155.00	.....	3.75	.....	$ 79,950.85
April 1, 1931 to December 31, 1931	591	82,088.89	552,658.07	134,536.00	104,199.00	122,690.5	684,625.5	712,835.79
January 1, 1932 to December 31, 1932	347	15,320.51	133,562.14	274.75	12,215.00	40,627.15	132,743.00	152,085.58
January 1, 1933 to December 31, 1933	249	16,971.75	64,489.12	4,383.50	13,953.50	41,694.50	59,545.00	100,008.43
January 1, 1934 to December 31, 1934	193	7,050.51	36,907.00	3,404.50	3,159.00	547.50	14,464.00	29,825.77
TOTALS	1,427	$122,118.30	798,761.52	142,753.75	133,526.50	205,563.40	891,377.50	$1,074,706.42

SUMMARY OF FIRE LOSSES WITHIN AND OUTSIDE ALBERTA FOREST RESERVES

October 1, 1930 to March 31, 1931	56	$ 1,238.31	11,187.115	155.00	.....	5.75	129.00	$ 80,022.54
April 1, 1931 to December 31, 1931	622	99,713.01	604,876.12	136,906.5	107,285.00	123,986.23	796,224.5	867,487.26
January 1, 1932 to December 31, 1932	379	18,811.55	136,117.89	282.75	28,078.00	44,472.15	133,748.60	160,876.31
January 1, 1933 to December 31, 1933	288	35,381.67	93,765.00	4,410.25	15,154.50	60,882.75	167,959.00	195,805.36
January 1, 1934 to December 31, 1934	240	38,169.02	58,870.00	4,914.50	12,359.00	3,208.50	224,014.00	126,021.64
TOTALS	1,585	$193,313.56	904,816.125	146,669.00	162,876.50	232,555.38	1,322,075.10	$1,430,213.11

*M.f.b.m.—Thousand, feet board measure.

REVENUE, ALBERTA FOREST RESERVES

Source of Revenue	*1930-31	1931-32	1932-33	1933-34		Total	This year in comparison with last	
							Increase	Decrease
Timber Permits	$ 6,159.32	$ 9,358.17	$ 6,096.73	$ 8,834.06	$ 9,935.68	$ 40,383.96	$ 1,101.62	.....
Timber Seizures	5.00	105.46	23.80	43.53	.....	177.79	.....	$ 43.53
Timber Sales	18,416.68	16,809.66	9,748.78	15,881.44	15,660.82	76,517.38	.....	220.62
Grazing Permits	3,416.79	10,394.88	12,098.99	13,033.83	14,838.72	53,783.21	1,804.89	.....
Hay Permits	.....	264.25	208.00	207.91	279.80	959.96	71.89	.....
Fishing Permits	.....	1,342.25	1,087.50	918.00	1,066.50	4,414.25	148.50	.....
Surface Rentals	1,631.84	1,813.21	1,971.28	2,308.85	2,376.19	10,101.37	67.34	.....
Miscellaneous Use Permits	.....	818.08	805.90	947.23	896.83	3,468.04	.....	50.40
Sundry Revenue	218.98	2,622.90	721.35	1,268.96	1,443.14	6,275.33	174.18	.....
Totals	$29,848.61	$43,528.86	$32,762.33	$43,443.81	$46,497.68	$196,081.29	$ 3,368.42	$314.55
							314.55	
						Net increase	$ 3,053.87	

*Six months to March 31.

NOTE: In 1930-31 year, "Timber Permits, $6,159.32" and "Timber Sales, $18,416.68" as given above, are included in the Revenue Statement of the Annual Report (Forestry Section) for that period in the net total appearing under heading of "Timber Permits, Sales, etc."

In 1931-32, year total of "Timber Sales, $16,809.66" includes "Application and Guarantee Deposits, $2,101.50"; "Sundry Revenue, $2,622.90" includes "Sale of Maps, $9.55." These items are shown separately in the Annual Report (Forestry Section) for that period.

In 1933-34 year, total of "Timber Sales, $15,881.44" represents totals of "Timber Sales, $13,556.44" and "Timber Sale Applications and Guarantee Deposits, $2,325.00" given separately in the Revenue Statement (Forestry Section) of this Report.

In 1934-35 year, total of "Timber Sales, $15,660.82" represents totals of "Timber Sales Guarantee Deposits, $1,770.00" and "Timber Sale Dues, $13,890.82" given separately in the Revenue Statement (Forestry Section) of this Report. Also in the same year, "Sundry Revenue, $1,443.14" represents totals of "Sundry Revenue, $952.60" and "Miscellaneous (services and supplies), $490.54," given separately in the Forestry Section.

Grazing on Forest Reserves.—Grazing on forest reserves showed for the period under review an increase in cattle of 2,327 head but a decrease in horses and sheep of 644 and 3,627 respectively. A complete utilization of cattle and horse range was effected during the year in the Cypress Hills and Rocky Mountain forest reserves, in the latter as far north as the Elbow River, a condition which has been unusual in a number of years.

A comparative annual statement covering grazing on forest reserves is given in the Forestry section of this Report.

Timber Industry.—For the first time in several years an appreciable general increase was noted both in the number of operations and in the total output of the majority of timber products. This increase is not borne out by the figures in the tabulated statement which follows for the reason that this particular statement includes only lumber manufactured on timber berths and timber sales and does not include the heavy increased production under special timber permits. The general increase, though not particularly a large one, is to be regarded as satisfactory for the reason that there was not any noticeable improvement in the building and timber using industries.

LUMBER MANUFACTURED FROM PRODUCTS OF TIMBER BERTHS AND FOREST RESERVE TIMBER SALES

Fiscal Year	Licensed and Permit Timber Berths on Provincial Lands *(F.B.M.)	School Lands Timber Berths *(F.B.M.)	Timber cut on Alberta Forest Reserves Timber Sales *(F.B.M.)
*1930-31	20,002,746	627,534	2,849,528
1931-32	36,562,070	1,454,022	808,000
1932-33	45,375,413	277,631	2,372,779
1933-34	44,959,769	290,551	2,289,048
1934-35	41,157,434	935,087	3,225,447
TOTALS	188,057,432	3,584,825	11,544,802
	Decrease	Increase	Increase
This year in comparison with last	3,802,335	644,536	936,399

*Six months to March 31.
†F.B.M.—Feet board measure.

Nursery and Tree Distribution.—The tree nursery operations of the Forest Service were continued on a larger scale than in preceding years at the mental institutes at Oliver and Ponoka. The principal nursery at Oliver from which centre all transplants are shipped and seedlings are provided for the subordinate nurseries where patients from the mental institutes provide the labour under direction.

Improvements during this period were put into effect in the avenue of trees between North Edmonton and Oliver, the first planting of which was made last year. It had been hoped to continue the work to Fort Saskatchewan but the lateness of the season made this impracticable.

FISHERIES

Conditions in the Fisheries Division for this year were more satisfactory and prosperous than at any period during the past three years. Many fishermen's conferences were held with a view to removing the overlapping in production from various lakes. Angling showed an increase both in the number of angling permits and licenses issued and in the amount of fish taken.

Commercial Production.—Commercial fishing revealed an increase of 493,080 pounds over the preceding year. The value of this increase to fishermen was

$14,065.19 and the value as marketed $43,315.53. The total production showed increases in whitefish, tullibee, pike and perch with decreases in trout, sucker, ling, goldeye and mullet. Pigeon and Wabamun lakes experienced a much greater number of fishermen employed than in previous years, the numbers in fact exceeding those of any other lake in the Province.

Markets.—A noticeable improvement existed throughout the year regarding markets. Co-operation was brought into effect between the Fisheries Division and operators with a view to meeting requirements wherever possible and granting extensions of closing seasons when and as the market warranted.

Transportation.—Severe winter weather acted very much as a check to the improved methods of transportation, noticeable during recent years, which prevented many pedlars from getting their supplies from favourite lakes.

Domestic Fishing.—Domestic licenses totalled 654 with a catch of 616,840 pounds, the value estimated at $35,343., an increase of 205,590 pounds over the preceding year.

Indian Fishing.—Indian permits showed a reduction of 68 from last year in the total of 842 issued. Fish caught totalled 1,106,275 pounds with an estimated value of $57,976. Several prosecutions were instituted during the year against unscrupulous persons purchasing fresh whitefish caught in close season by Indians.

TOTAL AMOUNT OF FISH TAKEN FOR COMMERCIAL PURPOSES AND ITS VALUE

Fiscal Year	Weight (Lbs.)	Value to Fishermen	Value as Marketed
*1930-31	1,851,848	$ 70,624.00	$ 94,032.00
1931-32	3,337,980	115,928.10	189,927.88
1932-33	2,655,214	94,439.65	130,808.51
1933-34	3,566,356	131,124.35	200,755.24
1934-35	4,059,436	145,189.54	244,070.77
TOTALS	15,470,834	$557,305.64	$859,594.40
Increases this year in comparison with last	493,080	$ 14,065.19	$ 43,315.53

Licenses and Permits.—Annual comparative statement for the fiscal years from 1930-31 to 1934-35 showing totals of licenses and permits issued is given in the Fisheries Division section of this Report.

Angling.—An increase of 270 angling permits issued this year had a corresponding increase of 65,589 pounds in the year's catch for trout, Rocky Mountain whitefish and Arctic grayling. Fishing for rainbow, cutthroat and other types of game fish was exceptionally good during the year and reports from southern Alberta indicated that rainbow trout were thriving and giving greater sport than ever. Angling in this section of the province was in many respects better than it has been for years.

TOTAL AMOUNT OF FISH TAKEN BY ANGLING

Fiscal Year	Game Fish: Trout, Rocky Mountain Whitefish and Arctic Grayling (Lbs.)	Other Fish: Goldeye, Pickerel, Perch and Pike (Lbs.)	Total (Lbs.)
*1930-31	.....	1,225,000	1,225,900
1931-32	457,975	1,756,919	2,214,894
1932-33	422,638	1,260,034	1,682,672
1933-34	355,000	1,133,730	1,488,730
1934-35	420,589	977,214	1,397,803
TOTALS	1,656,202	6,352,897	8,009,099
This year in comparison with last	Increase 65,589	Decrease 156,516	Decrease 90,927

*Six months to March 31.

TOTAL AMOUNT OF FISH OF ALL CLASSES TAKEN BY ANGLING AND NETS

Fiscal Year	Angling (Lbs)	Domestic Fishing (Lbs)	Indian Fishing (Lbs)	Commercial Fishing (Lbs)	Total (Lbs)
*1930-31	1,225,000	113,200	1,130,000	1,851,848	4,320,048
1931-32	2,214,894	547,078	736,000	3,337,980	6,835,952
1932-33	1,682,672	458,000	860,000	2,655,214	5,655,886
1933-34	1,488,730	411,250	947,635	3,566,356	6,413,971
1934-35	1,397,803	616,840	1,106,275	4,059,436	7,180,354
TOTALS	8,009,099	2,146,368	4,779,910	15,470,834	30,406,211
	Decrease	Increase	Increase	Increase	Increase
Thi year in comparison with last	90,927	205,590	158,640	493,080	766,383

NOTE: The noticeable decrease in poundage under the heading of Indian fishing which followed the fiscal year 1930-31 is due to the fact that Indian fishing privileges were denied to half-breeds after the close of this period.

Rescue of Fish.—Serious drought conditions in southern Alberta during the last few years have been the cause of much apprehension and continuation of the rescue work in streams threatening to dry out was advantageously accomplished through the season.

Predaceous Fish removed from Trout Waters.—The removal of predaceous fish from trout waters was not so large during the year as in previous years due to the heavy removals of other seasons. Assistance was given in this work by fur farmers who required the suckers to feed their fur-bearing animals.

SUMMARY OF CONFISCATIONS AND PROSECUTIONS FOR INFRACTIONS OF FISHERIES REGULATIONS

Fiscal Year	Confiscations	Prosecutions
*1930-31	29	27
1931-32	40	68
1932-33	68	89
1933-34	53	62
1934-35	59	60
TOTALS	249	306
	Increase	Decrease
This year in comparison with last	6	2

FISH CULTURE—PLANTING OF GAME FISH FRY AND FINGERLINGS INTO PROVINCIAL WATERS OUTSIDE THE NATIONAL PARKS

Fiscal Year	Game Fish (Trout) Number of Plantings	Number of Fry
*1930-31	.....	.....
1931-32	157	2,236,500
1932-33	147	1,960,250
1933-34	168	2,180,850
1934-35	179	2,361,865
TOTALS	651	8,739,465
Increases this year in comparison with last	11	181,015

Lesser Slave Lake Hatchery.—Owing to economic reasons the Lesser Slave Lake hatchery was not operated during the year. Necessary repairs, however, were carried out during the summer and the building was placed in readiness in case it should at any time be needed on short notice for operation.

*Six months to March 31.

EXAMINATION AND STOCKING OF LAKES AND OTHER BODIES OF WATER

Fiscal Year	Lakes and other Bodies of Water examined regarding suitability for Stocking	Number found suitable	Number found unsuitable	Lakes and other Bodies of Water stocked during Season
*1930-31	....	....	....	....
1931-32	37	30	7	4
1932-33	20	9	11	22
1933-34	30	17	13	2
1934-35	15	8	7	27
TOTALS	102	64	38	55

REVENUE OBTAINED FROM FISHING LICENSES, PERMITS, SALES AND SUNDRIES

Fiscal Year	Revenue
*1930-31	$ 4,849.29
1931-32	18,861.22
1932-33	14,739.60
1933-34	15,071.61
1934-35	18,947.76
TOTAL	$72,469.48
Increase this year in comparison with last	$ 3,876.15

*Six months to March 31.

Coal

The output of coal produced in Alberta during the calendar year 1934 was 4,748,848 tons with a valuation of $12,440,616.53, an increase over the preceding year of 34,064 tons. In addition to this tonnage, 3,036 tons were produced by farmers under permit, for their own use, which figure is not included in the total output.

The production of coke is still on the increase. This production is confined to the Crowsnest area for use at the smelter at Trail, B.C. Efforts are also being made to produce coke for domestic purposes but this latter effort is in an experimental stage at present.

Disposition of Coal.—Coal sold for consumption in Alberta during the year totalled 1,087,898 tons; sold to other provinces and the Northwest Territories, 1,561,387 tons; sold for consumption in the United States, 13,739 tons; sold to railway companies, 1,687,850 tons; used for making briquettes, 14,765 tons; used for making coke, 91,745 tons; used under colliery boilers, 175,263 tons; used by colliery railways, 7,088 tons; put to stock, 53,147 tons; put to waste, 112,656 tons. The above tonnages include the coal lifted from stock and waste heaps.

COAL PRODUCTION

Calender Year	Tonnage	Valuation
1930	5,755,911	$19,379,000.00
1931	4,564,290	13,415,745.00
1932	4,870,030	13,441,193.00
1933	4,714,784	12,197,339.20
1934	4,748,848	12,440,616.53
TOTALS	24,653,863	$70,873,893.73
Increases this year in comparison with last	34,064	$ 243,277.33

OUTPUT OF COKE AND BRIQUETTES

Calendar Year	Coke, Tons	Briquettes, Tons
1930	.....	24,111
1931	.....	15,102
1932	2,183	13,582
1933	49,279	16,104
1934	59,703	15,906
TOTALS	111,165	84,805
	Increase	Decrease
This year in comparison with last	10,424	198

Disposition of Electrical Power.—Purchased electrical power used by Alberta coal-mines during the year totalled 19,447,621 k.w. hrs.

ELECTRICAL POWER USED FOR OPERATION OF ALBERTA COAL-MINES

Calendar Year	K.W. hrs.
1930	25,003,606
1931	16,918,625
1932	14,875,890
1933	17,611,959
1934	19,447,621
TOTAL	93,857,701
Increase this year in comparison with last	1,835,662

Electric Cap Lamps.—A number of mines have installed the latest type of electric cap lamps which give from 30 to 50 candle power and which materially increase the lighting effect.

Shale and Clay Mined

During the calendar year 1934, three shale pits produced 13,561 tons of clay and shale from which 4,398,032 bricks and 1,171 tons of hollow tile were made.

SHALE MINED—BRICKS AND TILES MANUFACTURED

Calendar Year	Shale Mined (Tons)	Bricks Manufactured (Number)	Tiles Manufactured (Tons)
1930	67,517	22,007,045	.....
1931	23,855	7,091,080	2,825
1932	8,446	3,444,010	182
1933	3,234	1,221,060	.....
1934	13,561	4,398,032	1,171
TOTALS	116,613	38,161,227	4,178
Increases this year in comparison with last	10,327	3,176,972	1,171

Mines Branch Annual Report.—Statistical information covering Alberta's coal-mining activities and production of shale and clay mined, for the calendar year 1934 is given in complete detail in the published Annual Report of the Mines Branch, Department of Lands and Mines, for this period, which appears as a separate publication to this Report.

Bird Sanctuaries and Public Shooting Grounds

The co-operation of the general public under the headings of bird sanctuaries and public shooting grounds was noticeable by the general absence of infractions in connection with regulations governing the administration of these areas.

Efforts are being made to locate more suitable locations for those sanctuaries suffering from continued drought. Weed menace in the dried out areas points to the necessity for either disposal of the lands or for cropping or grazing until the return of the wet seasons to restore the lakes.

Regulations Appertaining to Pleasure Boats

Regulations appertaining to pleasure boats were enforced for the first time in the province during this year. Inspections were made covering life saving devices necessary to be carried by boats licensed to carry passengers together with precautionary measures which limited numbers of passengers to the size of the craft.

Regulations were also effected for the control of mufflers on motor boats at pleasure resorts in order that the nuisance of open mufflers should be removed.

Individual detailed reports from the various Divisions of the Department follow.

Your obedient servant,

J. Harvie,
Deputy Minister.

September 17th, 1935.

Provincial Lands Administration

REPORT OF THE EDMONTON LAND AGENT, J. W. STAFFORD

A perusal of the Annual Report of the Edmonton Agency for the fiscal year ending March 31st, 1935, which is herewith submitted, will reveal a considerable reduction in the majority of transactions effected, together with a decrease in revenues received.

Revenue totals for 1933-34 and 1934-35 are as follows:—

Fiscal Year	Land Patents Branch	Timber and Grazing Branch	Mining Lands Branch	School Lands Branch	Tax Recovery Branch	Total
1933-34	$36,506.57	$123,579.70	$159,245.74	$ 49,511.99	$133.02	$368,977.02
1934-35	31,624.24	175,304.32	97,389.14	22,822.02	594.64	327,734.36
	Decrease	Increase	Decrease	Decrease	Increase	Decrease
This year in comparison with last..	$ 4,882.33	$ 51,724.62	$ 61,856.60	$ 26,689.97	$461.62	$ 41,242.66

The above statement discloses a decrease of $41,242.66 from last year in total revenue received which is principally attributable to the mining lands and school lands branches. An increase of $51,724.62 appears, however, from revenue derived from the timber and grazing branch.

In connection with the granting of homestead entries, a decrease of 465 is shown in the general total of 1,713 in comparison with last year's total of 2,178. Entries granted to women numbered 472 for this year.

In addition to the collection of ordinary revenue together with attention to matters of a routine nature, the following business was transacted:—

Homestead entries granted—1st 1,536, 2nd 177, Total	1,713
Soldier entries granted	18
Applications for petroleum and natural gas rights	6
Applications for coal mining leases	9
Domestic coal permits issued	12
Bar-digging permits issued	4
Certificates of work issued (quartz)	1
Placer mining claims granted	5
Quartz mining claims granted	6
Applications for school lands cultivation permits	120
Applications for provincial lands cultivation permits	7
Applications for grazing permits issued (school lands)	695
Applications for grazing permits issued (provincial lands)	154
Applications for grazing leases (provincial lands)	22
Timber permits issued (provincial lands)	1,741
Timber permits issued (school lands)	214
Permits to operate custom saw-mills	175
Hay permits issued (school lands)	370
Hay permits issued (provincial lands)	641
Number of applications for patent received	810
Number of applications for patent recommended	620
Number of applications for patent dealt with	3,290
Number of applications for patent checked for head office	2,125
Number of applications for cancellation received	839
Number of cancellation proceedings instituted by this office	241
Number of entries cancelled	1,233
Number of timber berths on provincial lands sold	98
Number of timber berths on school lands sold	14
Number of letters received	56,319
Number of letters dispatched	61,827
Number of stencils cut, 181; number of pages mimeographed	55,454
Number of translations for this and other departments	341

The following statement sets forth the amount of revenue collected each month with classification thereof:—

Month	Lands Patents Branch	Timber and Grazing Branch	Mining Lands Branch	School Lands Branch	Tax Recovery Branch	Total
1934—						
April	$ 3,107.64	$ 10,477.88	$ 7,119.59	$ 2,344.08	$ 20.75	$ 23,069.94
May	2,917.09	15,507.98	12,901.03	1,582.43	41.05	32,949.58
June	2,725.44	26,932.68	5,729.91	1,001.64	242.09	36,631.76
July	3,306.62	11,179.94	2,851.10	1,795.14	144.12	19,276.92
Aug.	2,236.25	13,368.34	3,078.62	810.89	30.10	19,524.20
Sept.	2,373.27	4,282.95	11,413.73	412.83	.....	18,482.78
Oct.	2,930.00	8,498.05	6,778.37	916.50	.....	19,122.92
Nov.	3,788.85	19,274.76	9,998.76	1,777.14	50.00	34,889.51
Dec.	3,088.78	8,792.21	8,202.31	2,912.74	17.54	23,013.58
1935—						
Jan.	1,912.81	17,732.27	11,537.60	2,641.99	1.00	33,825.67
Feb.	1,618.19	25,541.91	10,210.97	1,539.46	11.20	38,921.73
March	1,619.30	13,715.35	7,567.15	5,087.18	36.79	28,025.77
Totals	$31,624.24	$175,304.32	$ 97,389.14	$ 22,822.02	$594.64	$327,734.36

These revenues comprise payments on account of land sales, royalties and rentals on coal, petroleum and natural gas leases, rental on grazing leases, fees covering quartz and placer claims, homestead entry fees, payments for the issue of grazing and cultivation permits on school lands and business of a similar nature.

Logging and lumbering operations this year employed an increased number of men and while no material increase is shown in lumber manufactured, a very gratifying increase of approximately 400,000 appears in the manufacture of railway ties.

The following statement shows the products manufactured by the holders of timber berths under yearly license and permits:—

Timber Berths	License Berths	Permit Berths	School Lands Berths
Lumber manufactured F.B.M.*	25,785,818	14,265,499	935,087
Railway ties	154,483	542,342	36,757
Piling, lineal feet	1,250	3,108	.....
Mining timber, lineal feet	6,918	5,140	.....
Laths	4,976,960	990,500	.....
Building logs, lineal feet	.....	256	.....
Fence posts	.....	200	.....
Shingles	350,000	839,500	.....
Shingle bolts, cords	.....	13	.....
Cordwood, cords	379	2,018	18

The total amount of lumber manufactured during the fiscal year on berths is shown to be 40,986,404 feet, board measure, together with a total of 733,582 railway ties.

Miscellaneous permits totalling 1,741 were issued authorizing the cutting of timber on provincial lands with 214 issued on school lands. The quantity of timber authorized to be cut under these permits totalled 18,770,467 feet, board measure, as shown in the following statement:—

Timber Permits	Provincial Lands, Amount Authorized	School Lands, Amount Authorized
Lumber, F.B.M.*	12,055,135	6,715,332
Railway ties	260,305	13,150
Piling, lineal feet	17,520	.....
Mining timber, lineal feet	263,062	30,000
Telegraph and telephones poles	8,383	.....
Building logs, lineal feet	199,846	3,860
Fence rails	1,239,277	1,200
Roof poles	274,298	100
Fence posts	298,129	3,310
Shingles	241,000	9,250
Shingle bolts, cords	8	.....
Cordwood, cords	5,637	959

Timber Permits	Provincial Lands Amount Authorized	School Lands Amount Authorized

*F.B.M.—Feet, board measure.

One hundred and thirty-five seizures were made of timber cut from provincial lands and eleven of timber cut from school lands, as follows:—

TIMBER SEIZURES

Amount of timber covered thereby:—	Provincial Lands	School Lands
Logs, lineal feet	22,588	2,200
Lumber, F.B.M.*	1,964,638	3,500
Fence posts	13,727	.....
Roof poles	86	.....
Fence rails	2,596	40
Ties	27,673	1,669
Cordwood- cords	61	22
Shingles	47,000	.....
Mine props	727	.....

*F.B.M.—Feet, board measure.

A total of 641 hay permits was issued on provincial lands, authorizing the cutting of 6,836 tons, and under authority of which 5,024 tons were cut.

On school lands 370 permits were issued authorizing a total cut of 2,007 tons, in connection with which 1,289 tons were cut.

Four hay seizures covering a total of 66 tons were made on provincial lands together with two covering 30 tons on school lands.

REPORT OF THE CALGARY LAND AGENT, M. GOSSIP

The volume of business in the Calgary Land Office for the fiscal year ending March 31st, 1935 compares very favourably with the immediate three or four preceding years and shows an increased revenue of $15,686.43 over the fiscal year of 1933-34.

Revenue totals for 1933-34 and 1934-35 are as follows:—

Fiscal Year	Lands Patents Branch	Timber and Grazing Branch	Mining Lands Branch	School Lands Branch	Tax Recovery Branch	Total
1933-34	$ 9,023.98	$ 13,216.07	$212,334.69	$ 27,999.99	$442.02	$263,016.75
1934-35	6,784.48	25,255.42	213,283.43	33,110.57	269.28	278,703.18
	Decrease	Increase	Increase	Increase	Decrease	Increase
This year in comparison with last..	$ 2,239.50	$ 12,039.35	$ 948.74	$ 5,110.58	$172.74	$ 15,686.43

Owing to increased activity in all branches of the work, but more particularly in connection with the disposal of rights under the petroleum and natural gas regulations the staff of the office has been very busily engaged during the year.

It will be noted from a statement below that 373 applications for petroleum and natural gas leases were filed in the office as compared with 80 such applications during the year ending March 31st, 1934. Included in these applications were 90 parcels disposed of by public tender, comprising an area of 19,650 acres, the bonuses received amounting to $11,349.50 as compared with 25 parcels disposed of last year, comprising an area of 4,580 acres, with bonuses amounting to $6,639.50.

Homestead entries granted only amounted to 333, as compared with 532 for the previous year, showing a decrease of 199. The decrease in this business is partly attributable to the fact that homesteading was discontinued in the greater part of the district on January 2, 1935.

The number of applications for patent received, as well as cancellations accepted, showed an increase, although the number of entries cancelled were somewhat smaller than last year.

The volume of correspondence in the office showed a material increase.

There was no activity in placer or quarts mining during the greater part of the year but several applications have been filed in the office through an

Emergency Recorder, the locations of which cover stakings in an isolated part of the district west of Rocky Mountain House. These claims, however, have not yet been granted.

The following is a statement of the business handled in the Agency during the year in addition to the collection of revenue and the transaction of business of an ordinary routine nature.

STATEMENT OF BUSINESS TRANSACTED

First homestead entries granted	179
Second homestead entries granted	66
First homestead entries granted to women	87
Second homestead entries granted to women	1
Soldier entries granted	4
Applications for grazing leases	90
Applications for petroleum and natural gas leases	373
Petroleum and natural gas leases cancelled	634
Sales of petroleum and natural gas rights	90
Applications for coal mining leases	21
Domestic coal permits issued	34
Coal leases and permits cancelled	64
Quartz applications received	35
Quartz claims granted	1
Placer claims granted	3
Cultivation permits issued on school lands	98
Cultivation permits issued on provincial lands	10
Grazing permits issued on school lands	849
Grazing permits issued on provincial lands	146
Applications for cultivation leases received	446
Timber permits issued	380
Custom saw-mill permits issued	26
Hay permits issued on provincial lands	128
Hay permits issued on school lands	66
Homestead cancellations:—	
Cancellation proceedings instituted by head office	353
Cancellation proceedings instituted on behalf of public	61
Total number of cancellation proceedings instituted	414
Number of entries cancelled	353
Number of letters received	46,592
Number of letters dispatched	55,527

The total revenue received at this office during the year amounted to $278,703.18 and was applied as shown in the statement given below. The revenue increase of $15,686.43, already referred to, was received from the timber and grazing, mining lands and school lands branches.

Statement of the different classes of revenue received during the period of this report is as follows:—

Month	Land Patents Branch	Timber and Grazing Branch	Mining Lands Branch	School Lands Branch	Tax Recovery Branch	Total
1934—						
April	$ 505.66	$ 3,005.88	$ 27,441.57	$ 4,950.37	$ 46.68	$ 35,950.16
May	513.30	1,691.72	23,420.56	4,185.05	31.20	29,841.83
June	1,503.79	2,682.69	13,901.63	1,301.88	23.56	19,413.55
July	554.40	1,416.24	10,133.88	1,950.31	7.40	14,062.23
Aug.	427.70	1,567.86	9,711.94	1,031.03	14.00	12,752.53
Sept.	348.40	1,034.98	16,296.50	926.45	22.72	18,629.05
Oct.	669.40	1,887.84	21,735.79	1,079.13	10.89	25,383.05
Nov.	480.05	2,730.94	20,128.22	1,765.18	.....	25,104.39
Dec.	674.47	3,214.37	15,417.66	2,423.70	10.32	21,740.52
1935—						
Jan.	311.87	2,045.96	18,336.53	1,916.51	6.00	22,616.87
Feb.	338.94	2,471.54	18,808.28	2,543.27	29.28	24,191.31
Mar.	456.50	1,505.40	17,950.87	9,037.69	67.23	29,017.69
Totals	$6,784.48	$25,255.42	$213,283.43	$ 33,110.57	$269.28	$278,703.18

Some improvement was evidenced in timber activities during the year, more especially in railway tie production, but no material advancement can be expected in such industry until general conditions improve.

The following statements cover such operations in this District during the year, viz:—

TIMBER PRODUCTS MANUFACTURED BY HOLDERS OF TIMBER BERTHS UNDER YEARLY LICENSE AND PERMIT

	License Berth	Permit Berth
Lumber manufactured, F.B.M.*	641,900	464,217
Lumber sold, F.B.M.*	1,891,576	499,619
Saw logs cut, lineal feet	21,086	18,303
Saw logs manufactured, F.B.M.*	15,853	14,658
Railway ties manufactured	2,795	18,351
Railway ties sold	2,795	18,351
Mine ties manufactured	.....	95
Mine ties sold	.....	95
Lath manufactured	95,000	.....
Lath sold	95,000	.....
Mine timber manufactured, lineal feet	.....	102,090
Mine timber sold, lineal feet	.....	102,090
Cordwood cut, cords	64	.....
Cordwood sold, cords	64	.....
Shingles manufactured	.....	85,000
Shingles sold	.....	85,000

TIMBER PRODUCTS MANUFACTURED BY HOLDERS OF SCHOOL LANDS TIMBER PERMITS

Railways ties	1,500
Cordwood, cords	194
Lumber, F.B.M.*	63,010
Mining timber, lineal feet	56,000
Fence rails	150
Fence droppers	1,600

TIMBER PRODUCTS MANUFACTURED BY HOLDERS OF PROVINCIAL LANDS TIMBER PERMITS

Cordwood, cords	713
Fence posts	27,060
Building logs, lineal feet	14,776
Lumber, F.B.M.*	282,815
Roof poles	2,041
Mine timber, lineal feet	257,642
Rails	4,570
Railway ties	31,393
Shingle bolts, cords	25
Lagging, cords	34

*F.B.M—Feet, board measure.

SCHOOL LANDS TIMBER SEIZURES

Number of seizures		3
Poles	460	
Rails	100	
Wood, cords	3	

PROVINCIAL LANDS TIMBER SEIZURES

Number of seizures		12
Logs, lineal feet	500	
Mine timber, lineal feet	19,730	
Railway ties	1,230	
Wood, cords	36	

HAY PERMITS ISSUED

	Provincial Lands	School Lands
Number	128	66
Tons of hay covered by permits	2,443	1,017

REPORT OF THE LETHBRIDGE LAND AGENT, R. CRUICKSHANK

The business of this office for the fiscal year ending March 31st, 1935, as shown by the following information, indicates an increase in the volume of work over the preceding year with a revenue increase of $5,247.20.

Revenue totals for 1933-34 and 1934-35 are as follows:

Fiscal Year	Land Patents Branch	Timber and Grazing Branch	Mining Lands Branch	School Lands Branch	Tax Recovery Branch	Total
1933-34	$ 7,513.83	$14,835.98	$ 69,177.21	$ 21,074.52	$7,002.13	$119,603.67
1934-35	6,670.86	19,348.33	66,489.98	25,265.75	7,075.95	124,850.87
	Decrease	Increase	Decrease	Increase	Increase	Increase
This year in comparison with last	$ 842.97	$ 4,512.35	$ 2,687.23	$ 4,191.23	$ 73.82	$ 5,247.20

The total revenue derived from the business of this agency as shown in the revenue statement of the report does not include the amounts which have been remitted direct to head office.

The following outlines the business transacted in addition to the collection of ordinary revenue and work of a routine nature:—

STATEMENT OF BUSINESS TRANSACTED

Applications for grazing leases	294
Application for cultivation leases	289
Applications for petroleum and natural gas leases	124
Applications for coal mining leases	7
Applications for placer mining	1
Gravel permits	1
Domestic coal permits	30
Provincial lands grazing permits	271
School lands grazing permits	477
Provincial lands cultivation and grazing permits	201
School lands cultivation and grazing permits	71
Timber permits on provincial lands	16
Timber permits on school lands	2
Hay permits on provincial lands	5
Hay permits on school lands	3
Permits to cultivate land confined within the boundaries of ranches	8
Number of applications for patent received	164
Number of applications for patent recommended	118
Number of applications for cancellation received	11
Number of cancellation proceedings instituted by this office	67
Number of entries cancelled	101
Number of soldier grant entries granted	3
Number of first homestead entries granted	61
Number of second homestead entries granted	52
Number of homestead entries to women	31
Number of applications to purchase	4
Provincial lands cultivation and grazing leases	66
School lands cultivation and grazing leases	78
Number of letters received	28,508
Number of letters despatched	30,644
Grazing leases covering 2,177,999 acres	1,618
Coal mining leases covering 5,757.98 acres	60
Coal mining berths covering 2,239 acres	11
Miscellaneous leases	30

Most of the homestead entries were filed on land made available by the cancellation of grazing leases and abandoned pre-emption entries. The privilege of homesteading on land contained within the boundaries of this district terminated on the 31st December, 1934. A decrease of 253 in total of all entries granted is shown for this year.

The total revenue received at this office during the year was $124,850.87 and was applied under the headings as shown by monthly distribution in the statement shown below. The revenue increase of $5,247.20, already referred to, is distributed over collections from the timber and grazing, school lands and tax recovery branches. This increase is due to prompter payment of grazing rentals, increased interest in acquiring land for grazing purposes and a trend toward improved general conditions.

Statement of the different classes of revenue received during the period of this report is as follows:—

Month	Land Patents Branch	Timber and Grazing Branch	Mining Lands Branch	School Lands Branch	Tax Recovery Lands	Total
1934—						
April	$ 430.80	$ 1,285.42	$ 5,212.85	$ 2,990.39	$1,093.02	$ 11,012.48
May	538.50	1,132.36	3,629.78	1,022.40	375.40	6,698.44
June	387.40	1,247.51	4,233.91	1,840.35	817.70	8,526.87
July	296.27	863.01	5,371.53	2,307.99	315.35	9,154.15
Aug.	201.84	4,486.14	5,461.37	1,258.71	113.61	11,521.67
Sept.	471.50	663.22	7,213.37	1,212.60	113.77	9,674.46
Oct.	650.92	1,295.33	10,555.87	2,813.64	272.77	15,588.53
Nov.	722.76	1,835.44	5,321.46	1,968.71	436.76	10,285.13
Dec.	1,260.44	1,490.99	3,935.03	1,581.06	757.90	9,025.42
1935—						
Jan.	485.90	1,711.90	4,900.22	952.73	370.67	8,421.42
Feb.	690.38	919.94	6,483.53	2,071.99	815.42	10,981.26
March	534.15	2,417.07	4,171.06	5,245.18	1,593.58	13,961.04
Totals	$ 6,670.86	$19,348.33	$ 66,489.98	$ 25,265.75	$7,075.95	$124,850.87

TIMBER PERMITS ISSUED

	Provincial Lands	School Lands
Timber Permits issued	16	2
These Permits cover as follows:—		
	400 pine poles	400 fence posts
	100 fence posts split	8 cords of wood
	88 cords of wood	
	200 fence posts round	

TIMBER SEIZURES

	Provincial Lands	School Lands
Number	Nil	Nil

HAY PERMITS

	Provincial Lands	School Lands
Number	5	3
	70 tons of hay	45 tons of hay

HAY SEIZURES

	Provincial Lands	School Lands
Number (tons)	Nil	Nil

REPORT OF THE PEACE RIVER LAND AGENT, J. J. E. CLARKE

The report of the Peace River Land Agency for the fiscal year ending March 31st, 1935 shows, in comparison with the preceding year, an increase in revenue amounting to $3,830.47.

Revenue totals for 1933-34 and 1934-35 are as follows:—

Fiscal Year	Land Patents Branch	Timber and Grazing Branch	Mining Lands Branch	School Lands Branch	Fur Farm	Total
1933-34	$11,675.99	$ 6,832.34	$ 805.17	$ 3,106.15	.....	$ 22,419.65
1934-35	12,944.26	8,546.44	484.22	4,230.00	$ 45.20	26,250.12
	Increase	Increase	Decrease	Increase	Increase	Increase
This year in comparison with last	$ 1,268.27	$ 1,714.10	$ 320.95	$ 1,123.85	$ 45.20	$ 3,830.47

Payments for improvements were in a great number of cases made in small instalments as in the previous year. Collections continued to be slow and difficult resulting in a condition which necessitated the writing of a very large number of letters at close intervals.

The total of homestead entries granted for this year shows a decrease of 65 in comparison with last year's figures.

STATEMENT OF BUSINESS TRANSACTED

First homestead entries granted	218
Second homestead entries granted	29
Homestead entries granted to women	244
Soldier entries granted	5
Improvement payments	271
Land Sale payments	26
Cancellation fees	316
Letters of authority to re-file	244
Searches and maps	47
Applications for patent received	1,016
Applications for cancellation received	316
Cancellation proceedings instituted by this office	164
Entries cancelled	703
Cemetery, church and school sites	6
Custom saw-mill permits issued	76
Grazing permits, provincial lands	34
Grazing permits, school lands	143
Grazing rentals, provincial lands	113
Hay seizures and excess dues	20
Timber permits, provincial lands	1,204
Timber permits, school lands	6
Timber seizures dues	56
Hay permits issued, provincial lands	230
Hay permits issued, school lands	69
Timber excess dues	149
Assignment fees re leases	33
Mining fees	2
Mining rentals	8
Mining royalty payments	50

Domestic coal permit	1
Cultivation leases, school lands	37
Cultivation permits, school lands	25
Fur farm application	1
Letters received	26,518
Letters written	28,644

In addition to this business, small items of a miscellaneous nature were also transacted.

The total revenue received at this office during the year was $26,250.12 and was applied under the headings as shown in the statement given below. The revenue increase of $3,830.47, already referred to, is derived from the land patents, timber and grazing, school lands and fur farming branches.

Statement of the different classes of revenue received during the period of this report is as follows:—

Month	Land Patents Branch	Timber and Grazing Branch	Mining Lands Branch	School Lands Branch	Fur Farm	Totals
1934—						
April	$ 1,111.65	$ 1,267.78	$ 97.62	$ 502.26	.....	$ 2,979.31
May	1,057.25	1,024.23	.05	266.71	.....	2,348.24
June	1,186.34	619.65	.90	559.52	$ 39.20	2,405.61
July	1,481.50	562.58	11.00	705.95	.....	2,761.03
Aug.	1,279.70	586.59	4.65	290.03	.....	2,160.97
Sept.	696.86	218.57	55.30	40.62	.....	1,011.35
Oct.	1,096.74	133.25	4.15	9.75	.....	1,243.89
Nov.	1,345.25	445.44	7.60	27.55	.....	1,825.84
Dec.	1,171.69	1,128.71	152.05	270.54	.....	2,722.99
1935—						
Jan.	557.50	501.56	43.60	252.34	3.00	1,358.00
Feb.	1,051.48	730.10	87.95	571.64	.....	2,441.17
March	908.30	1,327.98	19.35	733.09	3.00	2,991.72
Totals	$12,944.26	$ 8,546.44	$ 484.22	$ 4,230.00	$ 45.20	$ 26,250.12

The general total in the above statement is made up of homestead entry fees, payments for improvements, etc., as shown in the schedule of business.

This revenue does not include a number of payments on school lands sales and grazing rentals which were made direct to the head office during this period.

The season of 1934 produced the finest crops of grain and vegetables in every part of the Peace River and Grande Prairie districts that have been seen for a number of years. Evidence of this as far as vegetables were concerned was noticeable by the number of cars which were donated by residents and shipped to drought stricken areas last fall. Owing to the extremely wet autumn, however, a part of the crop was never cut and there was still grain in the stook waiting to be threshed when the snow went in the spring. As a result of the inclement weather the grain which was threshed graded very low and was tough and damp. The weather conditions last fall worked a very severe hardship on the farmers financially, which has naturally reacted on all lines of business including the collections of this office.

The demand for local coal continues in Grande Prairie and adjacent towns. Returns received to date show a slight decrease but there is no doubt that this will be fully covered when all the reports are in. Two coal leases were granted during the last fiscal year within a short distance of Peace River. It was expected that these leases would be operated during the winter now ending, but for some reason development has not taken place. There were 787 applications for patents recommended for final consideration by the Department during the year. All these applications required considerable care and attention and in a large number of cases a great deal of correspondence was necessary before they could be dealt with. One permanent sub-agent is established at Grande Prairie and three timber inspectors and one Fisheries' inspector are authorized to

transact business for this office at different points on certain days during each month. Business is also accepted for this area by head office and by the Edmonton, Calgary and Lethbridge land agencies all of which act in the capacity of sub-agents. This arrangement is beneficial to both the public and to this office in its reduction of counter work, which would otherwise be difficult, if not impossible, with the present staff.

TIMBER PERMITS ISSUED

	Provincial Lands	School Lands
Timber permits issued	1,204	6
These permits cover as follows:—		
Lumber, F.B.M.*	4,433,282	42,992
Building logs, lineal feet	145,463	1,384
Fence rails	40,607	450
Roof poles	6,506	.....
Fence posts	30,305	.....
Cordwood, cords	544	.....
Shingles	103,300	.....
Shingle bolts, cords	96	6
Piling, lineal feet	516	.....
Railway ties	1,618	.....
Telegraph and telephone poles	21,000	.....

TIMBER SEIZURES

	Provincial Lands	School Lands
Number	34	3
Amount of timber covered thereby:—		
Lumber, F.B.M.*	178,175	2,487
Building logs, lineal feet	7,218	1,768
Fence posts	1,987	400
Shingles	124,000	.....
Shingle bolts, cords	13	.....
Railway ties	250	.....
Logs	52	.....

*F.B.M.—Feet, board measure.

HAY PERMITS

	Provincial Lands	School Lands
Number	230	69
Tons of hay covered by permits	3,135½	527

HAY SEIZURES

	Provincial Lands	School Lands
Number	3	1
Tons of hay covered by seizures	17	5

Technical Division

REPORT OF THE TECHNICAL DIVISION, T. W. DALKIN

Notifications (Land Patents).—During the fiscal year ending March 31st, 1935, a marked increase over the preceding year was noticeable in the number of notifications issued and the area of land patented as revealed by the following figures:—

Nature of Grant	Notifications	Area (acres)	
Homesteads	1,155	181,627.082	
Sales	51	1,500.003	
Second Homesteads	506	80,125.178	
Soldier Entries	81	13,587.30	
Purchased Homesteads	3	457.81	
Pre-emption Sales	6	926.70	
Special Grants	52	40,806.565	
Exchange of Lands	4	1,121.00	
School Lands Sales	56	4,459.14	
Northern Alberta Railways Company	1	0.62	
Total	1,915	324,611.398	
Sales (Subdivisions)	88		(90 lots in Canmore Townsite)
	2		(Lots in McMurray Townsite)
	1		(Lot in Jarvie Townsite)
Total	2,006		

By way of comparison 1,106 notifications comprising an area of 165,224.553 acres, were issued for the fiscal year ending March 31st, 1934.

The most important of the special grants was issued to the Dominion of Canada upon representations made to the Department by the Hon. T. G. Murphy, Minister of the Interior. This grant covered a large tract of land comprising approximately 40,550 acres located in the forest reserve south of Kananaskis, now known as the Kananaskis Forest Experiment Station. This land (with the exception of mines and minerals) was transferred to the Dominion in order to carry out scientific work in sylviculture and to investigate other phases of forestry such as protections, mensuration and the effects of forests on stream flow and watersheds. The area selected was considered ideally suited for this work, and accordingly a grant was issued for the area, subject, however, to the following clause:—" . . . . if the Grantee, His Successors or Assigns, shall fail to use continuously the said parcel or tract of land herein before described solely for forestry experimental purposes, then in such case these presents and the grant thereby made, shall immediately become and be null and void, and shall immediately revert to and become vested in Us, Our Successors and Assigns, without notice of any nature whatsoever." Due to certain unsurveyed rivers which form boundaries of the area, the figure of 40,550 acres, must only be regarded as approximate.

Most of the other special grants comprised school sites, applications for which had been upon the records for some considerable time owing to the fact that the various school districts were unable through lack of funds, to purchase the lands in accordance with the policy adopted by the Dominion. In order to relieve the situation it was deemed advisable to pass an order in council on January 2, 1935, whereby applications for grants for school site would be issued free of charge upon compliance with the rules and regulations.

Included in the sales were 272.14 acres, more or less, comprising rights of way of the Northern Alberta Railways Company through lands belonging to the

School Lands Endowment Fund. These rights of way were included in the sale of the provincially owned railways.

Under Dominion administration lots in the Canmore townsite were held under lease. After investigation it was found expedient to change this policy and sell the lots to the leaseholders with the result that ninety lots were disposed of and were covered by eighty-eight notifications.

Homestead Entries.—During the year 2,712 homestead entries were checked as to the area covered by each application. Railway rights of way, roadways, power transmission lines, pipe-lines and all previously alienated parcels of land were excepted from the entries, and in cases where homesteads were affected by rivers, the fordableness of same was investigated in order that the entries where possible could be granted to the homesteads on both sides of the rivers.

Revested Soldier Settlement Board Lands.—Further tracts of land have been transferred to this Department by the Soldier Settlement Board. These tracts comprise an area of 29,167.77 acres, more or less, and are covered by 112 loans issued by the Board. The various duplicate certificates of title covering these lands were forwarded to the Land Titles Offices and new duplicate certificates of title received in the right of the province. These duplicates have been duly recorded and show that the lands have been transferred free and clear of all encumbrances. (See Privy Council No. 708—22/8/24.)

Tax Recovery Lands.—An additional area of 5,942.75 acres, more or less, has been transferred to the jurisdiction of this Department from the Department of Municipal Affairs. This area is now administered by this Department and was made available through tax recovery proceedings. A few additional areas in subdivisions were also transferred.

Work for the Royal Commission.—For practically two months the staff of this Division, together with additional help, was engaged in preparing maps, graphs, charts, schedules and statistics in connection with the presentation of the Province's claim against the Dominion for the alienation of the natural resources. This information covered a variety of subjects including maps of the irrigation areas, railway lands' subsidies, patented surface and under rights, mines, and numerous other maps and schedules including soil survey reports, lumber production, and other information. The urgency of this work necessitated considerable overtime upon the part of each member of the permanent staff whose whole-hearted co-operation was most commendable.

Road Diversion Surveys.—Compared with last year there was also a decided increase in the registration of plans of surveys covering new road diversions, a total of 167 plans being recorded affecting 498 parcels of land. In many cases these new surveys affected lands alienated by sales, etc., thus necessitating the filing of quit claims and the payment of compensation. Other new plans recorded covered railway rights of way and station grounds, spur lines, reservoir sites, and pipe-line and transmission line rights of way.

Leases, etc.—Many new leases and licenses of occupation were issued for various purposes. Two of these covered land at the extreme north end of the province, due to the mining activities in the Northwest Territories. In this connection a license of occupation was issued to private interests for the hauling of freight over a portage from Smith Landing Settlement to Fort Smith Settlement. A lease also was issued to the Dominion Government for a tract of land containing 200.50 acres, more or less, adjoining the north boundary of the province to be used as an airport. At the present time applications from the

Department of National Defence are being considered for licenses of occupation to cover gas beacon sites at different points in the Province.

Surveys.—The final surveys of two summer resorts have been completed. One is known as Crimson Lake Resort and is located north-west of Rocky Mountain House in township 40, range 8, west of the 5th meridian. The other is known as Waiparous Townsite and is located in township 27, range 6, west of the 5th meridian at the junction of Ghost River and Waiparous Creek. Applications have been received for various lots in these resorts, it being the policy of the Government to issue leases.

The final plan of survey has been received showing summer camp sites for religious, philanthropic and educational purposes in the north-east quarter of section 6, township 47, range 1, west of the 5th meridian bordering on Pigeon Lake. A lease has already been issued for the Swedish Mission Covenant Church and applications have been received on behalf of the Church of England, the United Church, the Kinsmen's Club of Edmonton, the Red Cross and the Religious Council of Alberta. Ather surveys included the site for a seaplane base at Cooking Lake, and the Blue Diamond coal-mining leases located in unsurveyed territory.

As new township surveys are completed and approved by the Surveyor-General at Ottawa they are recorded here. Two such surveys have been recorded and cover township 38, range 28, west of the 4th meridian, and township 49, range 27, west of the 5th meridian.

Maps.—Three thousand copies of the new issue of the Lethbridge-Calgary Agency Map were received and distributed to the land agencies. An order for four thousand copies of a new map for the Edmonton Land Agency was placed with the Dominion Government at Ottawa. At the present time this Division is collaborating with the Surveyor-General's office at Ottawa for the issue of two new maps of the Province of Alberta on a scale of thirty-five miles to the inch and sixteen miles to the inch. A complete stock of map publications is kept, and during the year supplies of sectional sheet maps, township plans, etc. were received from Ottawa to replenish stock in hand.

Grazing.—Special maps were prepared covering a large part of the province in order to assist the Supervisor of Grazing in making inspections in the field. These maps showed in detail the existing ranches, conflicting applications, and the present standing of lands adjoining the boundaries of same. A large number of descriptions were prepared for grazing leases which included leases in the Tilley East Area and cultivation and grazing leases. In the case of the latter leases, owing to a change of tenure on January 1, 1935, it was necessary to prepare legal descriptions for all cultivation and grazing permits then in existence. Up to the close of this year approximately nine hundred such descriptions have been draughted.

Records.—Progress was again made during the year in the completion of certain records with the result that an entire set of grazing plot books was prepared and forwarded to the Lethbridge Agency showing all the grazing leases in that district. The road plan index started in the previous year has now been completed up to and including range 26, west of the 4th meridian. A new set of recrds has been set up and forwarded to the Mining Lands Division showing the location of all quartz and placer claims. Another set of records has been prepared showing the disposition of all the school lands in the province. These plan records have been forwarded to the School Lands Division.

Forest service records were also given attention whereby a complete set of plan records has been draughted showing the location of all timber berths. Legal metes and bounds descriptions were also prepared for the new berths. Other metes and bounds descriptions have been prepared for the various types of surface leases in the forest reserves, and plan records set up showing the standing of lands in these reserves. A beginning has now been made on a further set of records showing by township the stands of timber in the province with a recorded estimate of quantity and type.

Information has been obtained regarding the riparian rights along the Bow and Elbow rivers in the City of Calgary. This necessitated the examination of all the original patents issued by the Crown recorded in the Calgary Land Titles Office, and in some cases an inspection on the ground in order that complete records may be available in dealing with applications to remove gravel from the rivers.

General.—Maps, plans, sketches, graphs, etc. were draughted covering a variety of subjects for the Administration Office, Forestry Division, Mines Branch, Petroleum and Natural Gas Division, Fisheries Division, the land agencies, other offices and the general public, including plans for the Half-breed Commission, tar sand areas in the north, Alberta oil fields, location of school lands' sales and grazing areas in the province. The engrossing of the Speech from the Throne and the farewell address to the Earl and Countess of Bessborough, together with work of a similar nature, was also carried out.

Petroleum and Natural Gas

REPORT OF THE DIRECTOR OF PETROLEUM AND NATURAL GAS, W. CALDER

During the period of this report there were numerous indications which pointed to the fact that general merchandising all over Alberta showed considerable improvement in comparison with recent years and that certain industries were resuming part time operations, all of which suggested a return of public confidence. In oil development, however, the effects of the depression were unfortunately still evident and prospecting operations during the year were limited with no discoveries of importance materializing.

As in previous years the principal drilling activity was carried out in the Turner Valley, the development being centred in section 28, township 18, range 2, west of the 5th meridian and also in section 21 of the same township and range. In the latter section an unexpected extension of the Turner Valley structure was proven which may lead to more southerly development in township 18 and still further south.

In the Highwood area a test well proved the limestone formation at a comparatively shallow depth and although the results were negative except for a flow of gas, the geological information obtained was sufficiently important to anticipate more encouraging results when further prospecting was done by the drilling of other wells in the area.

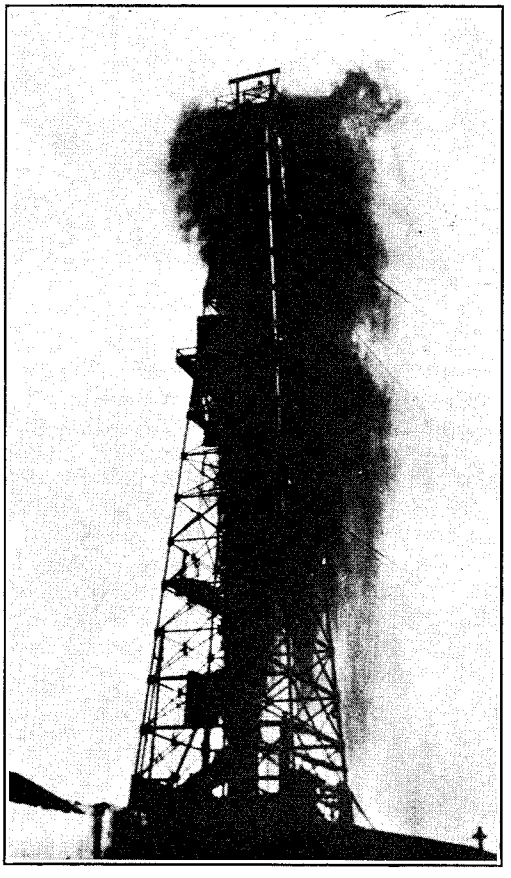
A new district where two tests were begun is that known as the Watson Structure in townships 9 and 10, range 2, west of the 5th meridian, situated about 15 miles north of Lundbreck. For some time previously another test had been in progress on this structure but owing to faulty equipment frequent accidents had held up the drilling. Operations at the two later tests, however, have been more successful and, subject to no unforeseen difficulties, these new wells should give conclusive information during 1935 and possibly open up a new era for development.

A test of considerable interest was started near the town of Cardston in township 3, range 25, west of the 4th meridian. The objective in view was to discover gas for the requirements of the town and to drill a second well later for the purpose of testing the oil prospects of deeper formations. The test well for gas is now over 2,000 feet and it is therefore evident that any oil formations which may be in the area must be very deeply seated.

Preparatory work for a deep test at Del Bonita, township 1, range 21, west of the 4th meridian was all completed during the late autumn but the start of drilling operations had to be postponed on account of bad roads when winter set in. The test, unfortunately, will be drilled with rotary, as at Twin River and Spring Coulee, and undoubtedly information on minor indications of oil and gas will not be obtained. This is very regrettable as the Del Bonita area would appear to be on a continuation of the productive structure which has been developed at Cutbank in Montana.

The second test well at Twin River, township 2, range 20, west of the 4th meridian, also encountered considerable oil and gas with a closed in pressure of 1,140 lbs. per square inch, the indications being similar to those encountered in the first well now abandoned. The oil would appear to have been in sufficient quantity to give a commercial production but as in the first test, the operators

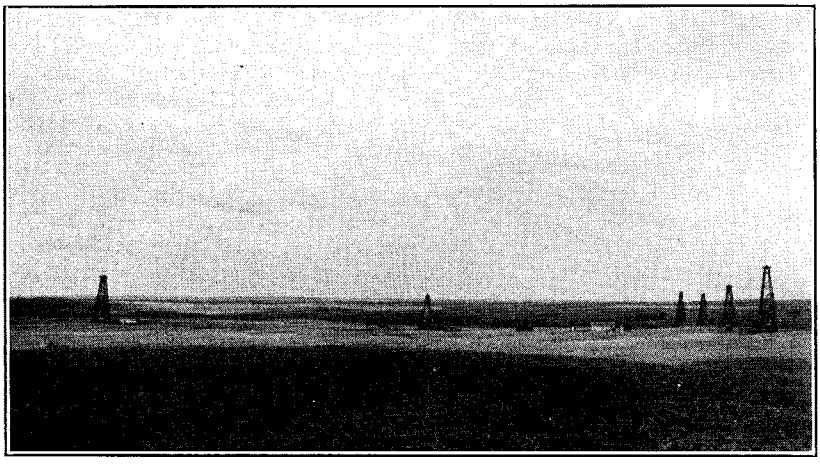
were not satisfied and endeavoured to increase the oil inflow both by shooting and acid treatment. Both of these experiments regrettably had a detrimental effect and for several months all operations have been suspended. In view of the encouraging oil flows met with in both test wells, it is hoped that further tests will be drilled as the indications tend to confirm the presence of an oil pool of considerable magnitude underlying the area.



Roney-Nordon, No. 1.
Section 2 township 2, range 20, west of the 4th meridian. Twin River district, Southern Alberta.
Total depth 3,904′, July 5th, 1933.

Following several years of drilling inactivity a well was started close to the Red Coulee producing wells. During operations a fair thickness of oil-bearing sand was penetrated but unfortunately the well, after a very short and inconclusive test, was abandoned without any effort being made to break up the sand formation either by small charges of explosives or any of the other known means used for creating the inflow of oil from tight formations.

This premature abandonment is to be regretted and shows a great lack of oilfield method as no well showing potential productive formation should be abandoned except after prolonged testing. The operator is now preparing to drill once more and it is hoped that every effort will be made to thoroughly test all sands that may be encountered. As over 200,000 barrels of oil have been



Red Coulee wells, Coutts, Alberta

produced to date from the few wells in the Red Coulee area in Alberta there is ample proof that an extension of the field northward will eventually be developed if only sufficiently prolonged test methods are adopted.

For various reasons the cleaning out and insertion of the new column of casing at the Aldersyde well was considerably delayed. This was satisfactorily completed, however, during the summer and with the well protected to the full depth with casing, attempts were made to continue the deepening. The latter, however, presented a continuous hazard owing to gas pressure lifting the light percussive tools off bottom. As this last danger might have led to a complete loss of the well the operators were recommended and authorized to install a diamond drill which would permit of drilling being continued without any extraordinary risk from a blowout. The operators, unfortunately, do not at present appear able to make the change.

In view of this and fully considering the geological formation and the promising oil and gas indications when drilling was suspended, the satisfactory completion of this well is, in a measure, a provincial obligation. Should the operator, therefore, be unable to continue the work with safe equipment there arises a responsibility on the Government to have this done by taking over any suitable diamond drill equipment not being used in the province and financing the cost of further deepening for at least 1,000 feet, the cost of drilling and any other expense to be a first charge on any production obtained. The suggestion may appear unusual but in view of the danger of the well being lost and development of the area being retarded for years, the suggested co-operation appears fully justified in the interests of the people of Alberta who undoubtedly would benefit should the well be satisfactorily completed.

A prospect of considerable interest is the well located in township 31, range 10, west of the 5th meridian, district of Olds. Prior to the suspension of drilling the strata samples showed favourable geological conditions pointing to the nearness of potential, productive strata. Drilling had to be suspended on account of severe weather, but with an improvement in road conditions it is anticipated that deepening will be resumed in the near future.

After resumption of drilling at the Duvernay-Brosseau well, township 55, range 12, west of the 4th meridian—referred to in last year's report, which showed drilling suspended at 1,463 feet—gas pressure had accumulated with sufficient

force to blow out all mud and water from the well. From geological examination of samples it would appear that the gas came from the Viking sand which was drilled through at about 1,330 feet.

Owing to the unexpectedness of the blowout the well orifice was unprotected by a gate or other closing in apparatus which would have permitted a correct gauging for pressure and volume. This was estimated, however, by the Divisional personnel to be in the neighbourhood of four million cubic feet.

Due to there being no local market for the gas, drilling was continued and although oil indications were reported by the drillers as noted at 1,650 feet and the formation samples showed considerable oil saturation the well was abandoned at 1,682 feet—a depth insufficient to prove the whole series of the potential oil-bearing formation. The well having been abandoned before a conclusive depth had been reached and without any prolonged effort to prove the possibilities of either the gas sand or the underlying oil sands drilled through, the test must be classed as inconclusive. Furthermore, owing to the unexpected blowout of gas, definite proof has been given that any form of water flush drilling should not be used in the drilling of deep wells in unknown territory, particularly while such exploratory wells are passing through potentially productive formations.

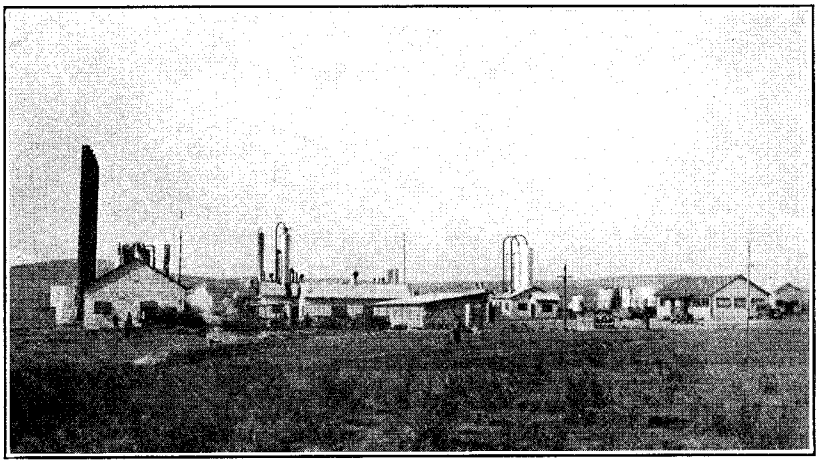
During 1932-33 a well drilled in township 66, range 23, west of the 4th meridian, near the town of Athabasca encountered approximately 50 feet of highly saturated oil sand at a depth of 1,640 feet. By advice of the Petroleum and Natural Gas Division a casing had been cemented and set before the sand was penetrated. Due to this precaution the oil was found to be free from water and showed a gravity of 12° Baumé. Production was reported at about 20 barrels per day but, unfortunately, no prolonged test was made to learn the oil inflow.

Early in 1934 deeper drilling was continued and other oil and gas sands were encountered together with a strong feeder of water at 1,770 feet. Limestone formation was entered at 2,185 feet and the formation samples for the first 200 feet showed considerable oil staining. The operator in cementing off the water horizon at 1,770 feet necessarily shut off all higher oil zones. As the cementation was not entirely successful the oil indications noted below the water stratum and in the limestone could not be properly tested. With such detrimental conditions it is not surprising that commercial production was not proven at depth and that the lower part of the well was abandoned to permit the testing of the 1,640 feet horizon. Again due to faulty bottom cementing the water rose in the well and caused continuous caving which prevented any test being made and the well was finally abandoned.

Continuing the previous annual practice, all wells in the Turner Valley area were tested for volume and pressure between the 20th of August and the 2nd of September. The tests showed that in maximum pressure wells the decline for the year amounted to 185 pounds while at wells showing the lowest pressures the loss was only 80 pounds. Based on the total operating days and the total pressures of all wells, the average pressure decline per day for the whole field was .35 pounds per square inch.

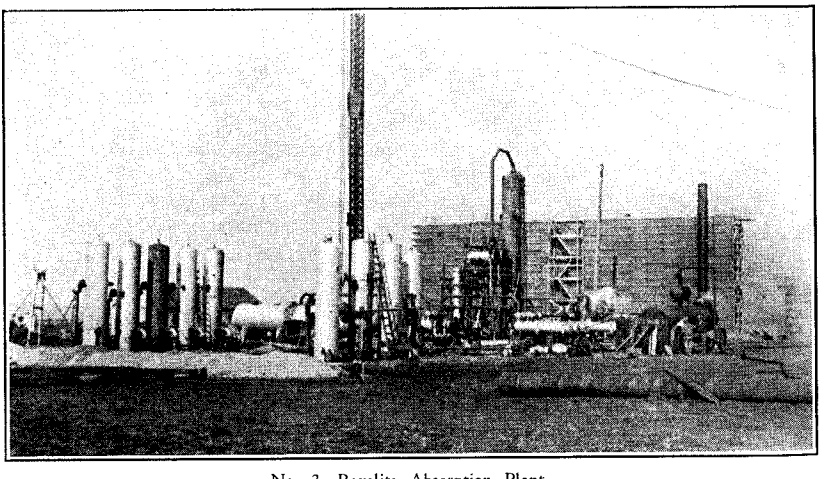
During the year the intensive drilling in section 28, township 18, range 2, west of the 5th meridian, has resulted in an unjustified decline in the well pressures of this area and it must be evident to all interested that an excess number of wells have been drilled on this one section. With pleasure it has to be recorded, however, that the majority of operators now fully appreciate that it is only by maintaining high back pressures on the wells that the best naphtha

recoveries can be obtained and also that if section 28 had not been operated under quota withdrawals set by the Division, the decline in pressure would have been considerably more rapid. Late in the year a second absorption plant was erected on section 4, township 19, range 2, west of the 5th meridian, and a further plant is projected on the adjoining section 33, township 18 of the same range. With these new plants in operation a still greater reduction will result in the waste of gas thereby considerably extending the exhaustion period variously forecasted but which now would have been very close had not the Provincial Government taken the initiative in controlling the waste.



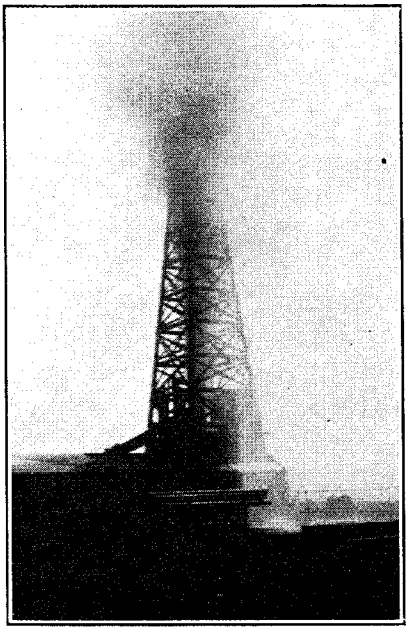
Gas and Oil Products Absorption Plant,
Section 4, township 19, range 2, west of the 5th meridian

An outstanding feature in the Turner Valley development occurred during the year. This was the acquiring by the major operating interests of the control by purchase from independent operators of the majority of limestone producing wells. By this transfer all naphtha carrying gas from the transferred wells is now available for processing by absorption. Further, as the gas volume now available considerably exceeds the capacity of the original absorption plant several wells have been completely closed in.



No. 2, Royalite Absorption Plant,
Section 33, township 18, range 2, west of the 5th meridian

The transfer in most cases only applies to production from the limestone, the original owners retaining the right to develop the crude oil horizons present in the overlying formations. The retention of these rights may now induce the independent operators to concentrate effort on crude oil production which can be obtained at a cost per well considerably below the cost of the wells drilled to the limestone.

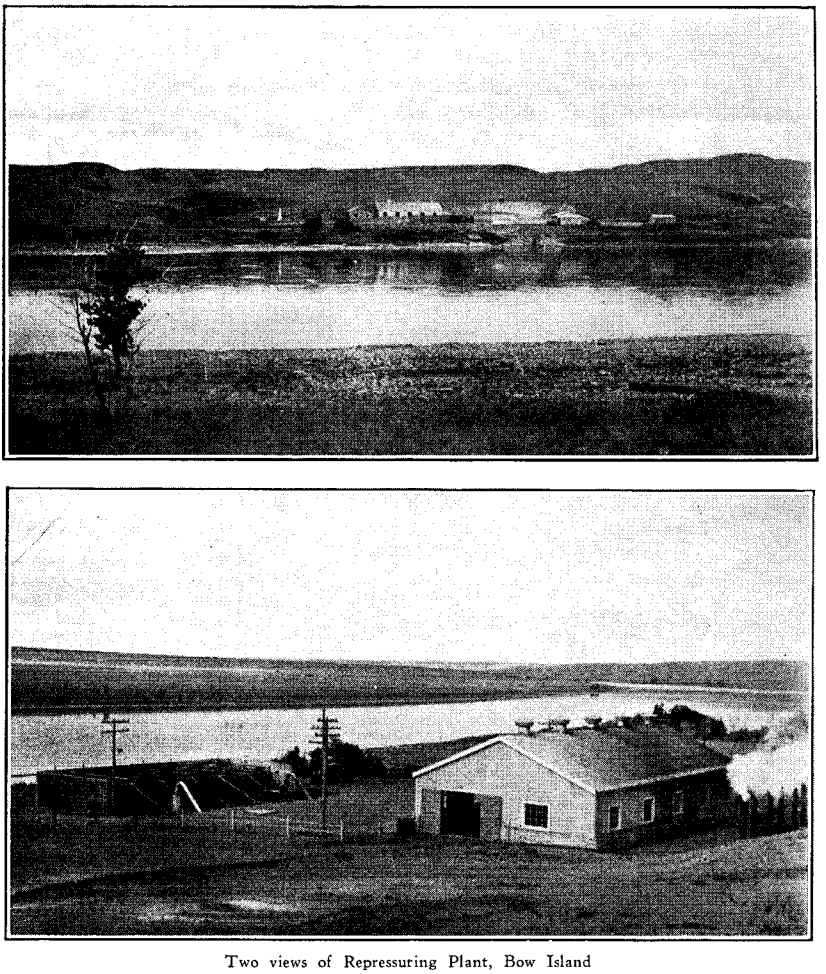


Crude oil flowing well,
Turner Valley, United No. 4

Although it was appreciated a long time ago that some constructive effort should be made to conserve the gas being dissipated at the Turner Valley it was only in 1929 that the first steps were taken towards this end. The operators of the nearly depleted Bow Island gas field then making application to the Dominion Government that the area be classed as a gas repressuring reservation, the latter to include the withdrawal of certain sections in townships 10 and 12, ranges 11 and 12, west of the 4th meridian from mineral leasing. The application was duly granted under P.C. Order No. 935, dated the 3rd May, 1930, and operations for rehabilitating certain wells and the abandonment of others were at once commenced together with the construction of the necessary repressuring mechanical equipment.

Turner Valley raw gas carries a considerable quantity of sulphur which is removed by scrubbing. During this process the natural pressure under which the gas issues from the wells is necessarily reduced. The scrubbing plant equipment, however, is so constructed that the scrubbed gas enters the pipe-line at a pressure sufficient to force the gas to the depleted area a distance of 160 miles away. In transit the pressure falls to 60 pounds necessitating mechanical equipment for raising it to exceed that in the repressuring wells.

The Bow Island repressuring plant consists of three 200 H.P., gas engine driven, straight line two stage compression units. In the first stage the pressure



Two views of Repressuring Plant, Bow Island

is raised to 190 pounds and in the second from 190 to 600 pounds and if necessary 800 should this be needed. Each unit is constructed for compressing one million cubic feet per day but under operating conditions the daily injection of gas has considerably exceeded the anticipated gross quantity.

Repressuring operations were started during 1930 and the plant has worked satisfactorily to date. From the time injection was started and up to the end of December, 1934, a total of 7,259,415,000 cubic feet of gas has been forced into the depleted sands with an increase in pressure from 248 to 480 pounds per square inch.

The injection of gas into depleted oil and gas sands is no new practice but this is the first attempt made in Canada. Those responsible for this effort are to be commended as not only have they assisted in saving a small portion of Turner Valley waste gas but also in creating a reserve which although at present insignificant will eventually represent a considerable quantity of gas for future requirements. The repressuring equipment having worked satisfactorily to date and apparently given an efficiency greater than the manufacturers' specifications,

it is to be hoped that the capacity of the plant will be considerably increased in the near future.

The satisfactory conditions reported for 1933 by the City of Medicine Hat in the Annual Report of their gas wells were fully confirmed during the 1934 tests supervised by the Divisional staff. Further slight increases at certain wells in the central area were noted and must now convince everyone that the rehabilitation and other work done at the Medicine Hat and Redcliff old wells was timely and fully justified and that formerly there must have been a considerable wastage of gas underground on account of leakage from defective well casings and distributing pipes.

The Onalto well after having been under Divisional control for a period was transferred back to the leaseholder when the Department of Lands and Mines obtained from the oil sales full payment to liquidate the overdue rentals and royalties together with the Divisional and other expenses made in connection with the operation of the well.

Supplementary reports prepared by members of the Divisional staff dealing with different phases of oil and gas operations in Alberta, together with the usual statistical data dealing with oil and gas production, drilling, and other information, follow this Report.

EXHIBIT A

1. OIL PRODUCTION FOR FISCAL YEAR

Barrels of 35 Imperial Gallons

Turner Valley, naphtha	1,192,226 bbl.
Turner Valley, light crude	19,827 "
Red Coulee, light crude	20,519 "
Wainwright, heavy crude	13,876 "
Sundry production	510 "
Total	1,246,958 bbl.

2. VALUE OF PRODUCTION 1934-35

Naphtha	$2,757,951.00
Light crude, Turner Valley	41,336.00
Light crude, Red Coulee	27,701.00
Heavy crude—Wainwright and other areas	14,386.00
Total	$2,841,374.00

3. SUMMARY OF OIL PRODUCTION IN ALBERTA

By Fiscal Years

Period	Turner Valley Naphtha	Turner Valley Light Crude	Red Coulee Light Crude	Wainwright Heavy Crude	Ribstone Heavy Crude	Skiff Heavy Crude	TOTALS	
1914-1933	5,722,855	357,757	163,981	54,449	15,074	5,914	6,320,030	bbl.
1933-1934	1,082,816	26,078	27,970	4,609	.....	.....	1,141,473	"
1934-1935	1,192,226	19,827	20,519	13,876	.....	510	1,246,958	"
TOTALS	7,997,897	403,662	212,470	72,934	15,074	6,424	8,708,461	bbl.

SUMMARY OF OIL PRODUCTION IN ALBERTA

By Calendar Years

Period	Turner Valley Naphtha	Turner Valley Light Crude	Red Coulee Light Crude	Wainwright Heavy Crude	Ribstone Heavy Crude	Skiff Heavy Crude	TOTALS	
1914 to 1932	5,530,762	352,677	155,188	52,607	15,074	5,914	6,112,222	bbl.
1933	952,885	23,822	31,057	5,276	.....	.....	1,013,040	"
1934	1,210,766	21,896	20,989	11,779	.....	510	1,265,940	"
1935—3 months	303,484	5,267	5,236	3,272	.....	.....	317,259	"
TOTALS	7,997,897	403,662	212,470	72,934	15,074	6,424	8,708,461	bbl.

4. TYPICAL ANALYSES OF ALBERTA CRUDE OILS

Sample from Field and Horizon	Gravity A.P.I.* Degrees	Specific Gravity	Sulphur %	Water %	Gasoline %	Kerosene %	Gas Oil %	Lubricants %	Gas Oil, Lubricants and residue, unsubdivided	Distillation loss
Turner Valley Crude Oil—										
Dalhousie Sand	50.2	.7787	0.13		69.3	13.5	7.6	7.0	2.5	0.1
Home Sand	40.1	.8245	0.12		33.0	14.6	21.5	17.4	13.0	0.5
McDougall Segur Sand	52.4	.....	.....		71.0	12.0	.....	.....	17.0	0.5
Red Coulee Crude Oil	29.3	.....	.....		19.5	19.8	.....	.....	60.7	....
Wainwright Crude Oil	22.1	.9210	2.22	Trace	14.4	4.5	21.0	25.9	33.3	....
Skiff Crude Oil	20.0	.9340	2.40	Trace	14.8	3.2	17.1	16.2	48.0	0.7
Ribstone Crude Oil	14.5	.....	.....	3.7	2.0	11.4	.....	23.3	59.6	....

*A.P.I.—American Petroleum Institute.

5. OIL PRODUCING WELLS IN PROVINCE

1934-35

	Producing	Shut in	Total
Turner Valley—naphtha and gas	88	7	95
Turner Valley—light crude only	9	....	9
Red Coulee—light crude	6	....	6
Wainwright—heavy crude	8	1	9
Skiff—heavy crude	....	1	1
Totals	111	9	120

6. GAS WELLS NOT INCLUDED WITH NAPHTHA PRODUCING WELLS

	Producing	Shut in	Total
Medicine Hat	46	....	46
Bow Island	....	11	11
Foremost	....	6	6
Milk River area	1	2	3
Viking	23	....	23
Kinsella	....	3	3
Fabyan	2	....	2
Brooks	5	....	5
Wetaskiwin	1	....	1
Totals	78	22	100

7. FOOTAGE DRILLED IN WELLS

Turner Valley area	70,555 feet
Other areas in Province	20,013 "
Total	90,568 feet

8. YEARLY WELL FOOTAGE DRILLED

Total for Province

Fiscal year, 1933-34	82,373 feet
Fiscal year, 1934-35	90,568 "

9. OIL IMPORTS TO ALBERTA

Calendar year 1933	1,266,161 bbl.
Fiscal year, 1934-35	1,891,412 "

10. GAS CONSUMPTION AND VALUE

By fiscal years

		Estimated value at two cents per M.c.f.* at well mouth
Fiscal year, 1933-34	16,346,376 M.c.f.*	$326,927.52
Fiscal year, 1934-35	16,600,059 "	$332,001.18

*M.c.f.—Thousand cubic feet.

11. ANALYSES OF NATURAL GAS

Turner Valley	Methane	Ethane	Propane	Butanes	Pentanes plus	Analyst
From Limestone Maximum	89.8	7.0	4.0	1.8	1.1	P. V. Rosewarne
Minimum	87.0	4.7	3.2	1.3	0.5	"
Mean	88.1	6.2	3.5	1.5	0.7	"
Dalhousie Sand (1 analysis)	85.0	7.4	3.8	2.1	1.7	"

Sulphur content in gas from above the limestone is either nil or very small. Gas from the limestone contains varying amounts of sulphur, but all of it requires scrubbing before transmission for domestic use.

	Specific Gravity	Methane	Ethane	CO_2	O_2	N_2	Analyst
Medicine Hat	0.56	97.8	0.3	0.4	0.0	1.5	R. T. Elsworthy
Foremost	0.61	94.2	0.8	0.3	0.3	4.4	"
Viking	0.64	92.5	3.5	0.5	0.1	3.4	"
Kinsella	.....	92.9	1.0	0.3	0.0	5.8	W. P. Campbell
Range	.....	98.0	....	1.9	0.0	0.1	"

Analyses by Campbell are equated to air free gas.

Range contains 10 or 12 grains of sulphur per 100 C.F.† Others quoted are free or practically free from sulphur.

12. GAS REPRESSURING—BOW ISLAND FIELD

Total gas injected into depleted sands to date equals 7,628,139 M.C.F.* Field pressure at March, 1935 increased to 480 lbs.

13. 1934 GAS WELL PRESSURES IN LBS. PER SQUARE INCH

Turner Valley	1,605 Maximum	445 Minimum
Medicine Hat	408 mean	
Redcliff	408 "	
Bow Island	480 "	
Foremost	583 "	
Viking	605 "	
Kinsella	754 "	

14. ESTIMATE OF WITHDRAWALS AND WASTE OF GAS AT TURNER VALLEY WELLS FOR FISCAL YEAR PERIODS

Fiscal Year	M.C.F.* Withdrawals	M.C.F.* Wasted
1926 (15 months to March 31st, 1926)	10,865,000	5,075,000
1926-27	9,985,000	5,365,000
1927-28	14,270,000	10,310,000
1928-29	23,990,000	13,760,000
1929-30	72,480,000	54,480,000
1930-31	143,890,000	128,460,000
1931-32	157,320,000	145,210,000
1932-33	95,880,000	85,310,000
1933-34	100,870,000	89,640,000
1934-35	87,560,000	76,440,000
Totals	717,110,000	614,050,000

*M.C.F.—Thousand cubic feet. †C.F.—Cubic feet.

15. DIVISIONAL INSPECTIONS OF WELLS

Special	128
General	1,197
Gas Measurements	780
Total	2,105

Additional to the above, special journeys by Senior of Division represent 70 days' absence from Edmonton.

DIVISIONAL GEOLOGICAL EXAMINATIONS OF WELL SAMPLES

Fiscal year, 1933-34	7,373 samples examined
Fiscal year, 1934-35	11,187 " "

EXHIBIT B.

METERING OF GAS WELLS

BY J. G. SPRATT, DIVISIONAL ENGINEER, PETROLEUM AND NATURAL GAS DIVISION

During the past two years, regulations calling for all gas produced in Alberta to be metered, have been made effective in Turner Valley for the purpose of obtaining more accurate records of gas production. Although objected to by some operators at first, owing to the cost, it is now generally agreed that they are beneficial to the operator as well as to the Department. In the first place, they give the operator a continuous record of the pressure held on the separator and any signs of freezing can be readily detected and overcome, thereby maintaining steady operating conditions on the well, which are essential for best production results. Secondly, as a continuous record of the gas produced along with the naphtha is available, one is able to obtain more efficient recovery in most cases. For example, one company found that once their meter was installed and the well operated under its proper quota, they were able to cut their gas withdrawals almost in half without affecting their naphtha decline.

Thus, they were not only saving gas and maintaining a higher rock pressure but as they cut down their gas production by about 4 million cubic feet, they also cut down a naphtha wastage of around 30 barrels per day, which was not recovered by the separator, but was being lost in the tail gas.

From the point of view of the Department, it is now possible to estimate more closely the reserves of the field as continuous records of the gas produced between known pressure drops are available whereas, prior to meter installations, only occasional "snap" measurements by pitot tube were obtainable on which to estimate production.

Advantages of metering gas from other fields, namely Medicine Hat and Redcliff, can also be cited. At both of these places industrial plants, consisting of brick, tile, sewer piping, potteries, glass manufacturing and flour milling companies, etc. have available free gas provided they drill wells on their own properties. As this gas has been considered "free" and of unlimited reserve by many companies, little attention has been paid to burning it as economically as possible. It is well known, however, that all gas fields have only a limited supply of gas and that supply is gradually being depleted whenever gas is produced. The Dominion Glass Company at Redcliff has installed the first meter for industrial plant purposes the installation being a gas flow air flow orifice meter to control the mixture of gas and air used in their glass furnaces. Since this meter has been installed, they have found it possible to maintain a much more efficient mixture with the result that they now save about thirty-five per cent of the gas previously used, and by means of their control are able to improve the quality of the glass manufactured. Most of the other industries have been closed down for long periods since the depression, but no doubt when business revives, they will profit by the experience of the Dominion Glass Company and meter the gas which they consume.

The City of Medicine Hat is gradually installing a system of metering gas from their wells, and once properly in operation, this system will prove of value in more ways than one. In the first place, they will have a better control on the gas produced from each well or group of wells to see that none are produced excessively. In all up to date gas fields it is now recognized that withdrawals of gas from wells should not exceed twenty-five per cent of the total daily open flow capacity. Excessive producing of a well causes caving necessitating frequent cleaning out, or it may in some cases cause the gas to be sealed off. In other cases, overpulling of wells hastens the appearance of bottom water which if not controlled may completely drown out the gas. Also if a cave is started around the bottom of the casing, water from higher horizons may make its way down around the casing and into the gas horizon. Another advantage of metering wells would be the detection of gas leaks in the gathering and other lines between the wells and points of consumption. The total gas produced from all wells could be checked against a central meter station and if the two did not tally, wells could be shut off until it was learned in what locality the leakage occurred. Apart from the economic aspect of this advantage, the danger to human life from gas explosion due to leaking mains, could be considerably reduced.

The orifice type of meter is used in the majority of cases, although where exceptionally small volumes are produced and steady pressures maintained, displacement meters can be used.

March 20th, 1935.

EXHIBIT C

TURNER VALLEY DRILLING PRACTICE

BY VERNON TAYLOR, ASSISTANT ENGINEER, PETROLEUM AND NATURAL GAS DIVISION

Prospecting operations for oil were first attempted at Turner Valley during 1912-1914 but, although crude oil and natural gas were discovered, development lagged and it was only in the years 1924-1926 that intensive work was begun. For several years cable tools were used exclusively but latterly both standard cable and rotary equipment have enjoyed equal prominence, and of the last twenty-three rigs started in the Turner Valley, ten were drilled with rotary, eleven with standard cable and two were started with cable and finished with rotary equipment.

At several wells the diamond drill was occasionally used to complete them in the limestone formation. This system was also installed at others for cleaning out bridges, a process which cleaned out and brought the well back to production under greater control. During the last few years, however, with only one exception, the diamond drill has not been used.

Equipment

Cable tools.—Derricks are usually 94 feet high, both steel and wood being used. In a few cases derricks 87 feet and 122 feet have been erected. Heavy rig iron equipment is used entirely with one 65 or 85 H.P. boiler carrying about 150 pounds steam pressure, and a 12″×12″ single cylinder steam engine.

Rotary.—The derricks are usually 122 feet high being constructed either of wood or steel. Occosionally derricks 136 feet in height are erected. The rotary drilling equipment is all heavy duty type and the Haliburton drilling control is used at about 50% of the wells. For steam generation three and sometimes four boilers carrying about 250 pounds steam pressure are installed with 12″×12″ twin cylinder engine. Two slush pumps usually 14½″×7½″×18″ are rigged up. Only one, however, is required, the other serving as a stand-by or auxiliary.

Rotary Drill Stem.—One contractor uses a string of 8″ until the surface string is set after which a 6″ is used to a depth of 2,000 to 2,500 feet. Thereafter 5″ until the 8⅝″ casing is set. If the 8⅝″ casing is set in the lime the well will be completed with a 4″. In some wells oil is used for drilling in the lime formation in which cases a flush joint stem is always used. At several wells a 6″ has been used for drilling from the surface until the 8⅝″ casing is set. In wells where the 6⅝″ casing is cemented and set in the lime the practice is to complete the drilling with a 3″.

Casing Programmes

Cable tools.—A cable tool drilled well is usually spudded with a 20″ hole. In some cases this is increased to 24″. The 20″ hole is carried to a depth where the first casing or surface string has to be landed. In the majority of wells the practice has been to cement and set this pipe below the surface water table so as to keep the hole dry below that depth. In parts of the Home area where the wells started close to the main Cardium sand it was found that this sand at depth carried water and necessitated the water shut off string being set at a lower depth than in other parts of the Valley.

In the south end, which might be called the new area, conditions are a little different and wells start either in Uppermost Benton or in the Basal Belly

River. For those wells starting in sandy parts at the top of the Benton it was recommended that the surface string be cemented below the base of the sandy series. In the first wells which started in Belly River formation it was difficult to foretell where the water horizons might occur and operators set the shut off column at about 500 feet. Later practice showed that water was seldom met below 460 feet and the water shut off column is now set at this point. This column is always cemented with varying amounts of cement, the amounts running between 100 and 250 bags.

After the water string has been set an 18" hole is drilled to about 1,500 feet when the 16" column is run. In several wells this pipe was not used and drilling was continued with open hole until the 13⅜" was run. The 16" casing is usually allowed to hang free and in the majority of wells is pulled just before the following column is inserted; this being the 13⅜" which is usually set at or about 2,500 feet. The insertion of the last pipe greatly depends on the formation being drilled and often it is possible to carry the column beyond 2,500 feet by underreaming. This casing is seldom cemented and usually landed and set in clamps or a reganhead in the cellar.

Following the 13⅜" casing, a 12½" hole is drilled which will permit the insertion of 10¾". Most operators endeavour to carry this column to as near the Home sand as possible since the formations below this horizon can be drilled without excessive caving, permitting the 8⅝" casing to be carried to the top of the limestone. In a few wells the black shales above the Belemnite series, also the "Poker chip" shales, give trouble by caving, more especially where the Dalhousie sands carry crude oil. Where this caving difficulty arises the hole is underreamed so that the 8⅝" can be carried down and cemented as the producing string. In wells where considerable oil is noted in the Dalhousie sand operators endeavour to estimate the amount of cement so that the oil sand will not be cemented off, the quantity of cement used ranging from 100 to 500 bags.

Rotary.—The general practice is to complete wells with only two strings of casing, the first used for water shut off purposes and the second as the production column. To minimize the possibility of deflection the water shut off column is set at a much greater depth than is customary in cable drilled wells. The diameter of this pipe is usually 13⅜" which is cemented and set at depths ranging from 500 to 1,200 feet. From the point where the 13⅜" is set the hole is drilled 11" in diameter which permits of the production column being carried to the limestone and there securely cemented. The quantity of cement used, ranging from 1,200 to 2,200 bags, is often sufficient to cement the casing solidly to the surface. In wells where the limestone is deeper than 5,500 feet or where drilling difficulties were encountered it was found necessary to insert an extra pipe, the 8⅝" casing being run to about the depth of the Home sands and there cemented. Thereafter the 6⅝" is inserted as a production column and is cemented up to the preceding casing.

Drilling Times.—With the lapse of time and improved drilling bits and equipment, a great advance has been made in the last two or three years in reducing the time of drilling. Up to 1929-1931 nine to eighteen months were required to drill in a well. Now the best time has been cut down to 128 actual drilling days or just a little better than four months with a total elapsed time for completion of the well of four months and three weeks. The particular well where this record was attained was 5,657 feet in depth and for drilling time it represents an average daily footage of 44.2 feet. It is difficult to compare the drilling records between rotary and cable tools as various factors

such as small showings of crude oil in upper horizons hinder the progress of the cable drilled well. Regrettably these oil showings are seldom, if ever, noticed in the rotary drilled well. However, for comparison purposes, the data from several wells recently completed in the south end of the Turner Valley is hereunder given.

Cable.—Best working time to the top of the limestone formation at a depth of 5,348 feet was 196 days or an average daily footage of 27.3 feet. For full completion of the well to 5,755 feet 251 days were required, making 17.5 feet an average daily footage for the last three wells completed.

Rotary.—Working time to the top of the limestone at 5,460 feet, 114 days, with average daily footage, 47.9. Average daily footage for completion of well at 6,125 feet, 47.5, with an average daily footage, for the last 5 wells completed, of 34.5.

It is necessary to here mention that two out of the three cable drilled wells used for obtaining the above data encountered drilling troubles which delayed the deepening for a considerable period and thus reduced the average daily footage appreciably. It is also necessary to note that in the five rotary wells used for the average only one was drilled in with oil. For the remainder water was used which penetrated the formation and delayed full production from the well for periods ranging from one to two months. Cable drilled wells being drilled free from water when reaching the productive zone come into full production within a few days of completion.

Drilling Methods

Cable tools.—Drilling methods with cable tools are now fairly standardized and as the territory is becoming better known the drilling crews are attaining greater success. This has been achieved particularly by keeping mud in the hole during all the drilling time, and instead of bailing out all the mud, to allow one bailer to probably be withdrawn and one bailer of water dumped to thin the mud. In formations which do not make mud easily it is a common practice to put a little in to start the drilling. By this method there is a certain mudding effect which has a tendency to minimize caving.

Rotary.—The first part of the hole made in a rotary well is usually cut with a fish tail bit. These bits are specially dressed with stellite (tungsten carbide) to give a good hard cutting surface. Quite often hard formations such as the Belly River sands or sands in the Upper Benton cannot be drilled with these bits and rock bits are used. After the surface or water shut off column is set the hole is reduced to 11″ and in softer formations—such as the Alberta shales —a drag bit is used. This is a K.P. bit which has two removable steel cutters that can be replaced as required. As already stated, however, this bit is usually only used in softer formations. Below this depth rock bits—the Hughes Cone rock bit or the Reed Roller bit—are used almost exclusively and although more expensive they can usually be run for a longer time.

Depending on the formation the footage made by these bits vary. In the Benton runs as high as 160 to 180 feet can be made without pulling out. In the Blairmore-Kootenay the average is reduced to about 50 feet, but in some cases as much as 120 feet have been drilled. The tools in softer formations usually remain in the hole for 36 to 48 hours. In the harder formations (Limy series, upper Dalhousie, Belemnite conglomerate) only a few feet can be made at each run and cones and rollers come out of the hole almost smooth. Similarly in the limestone the footage varies greatly. In some parts of the lime

section very hard bands exist, probably cherty, in which only a foot or so can be made during a run. On the other hand, in some of the porous strata, runs of 150 feet or more have been made.

Another point in improved rotary well drilling technique is the greater care given to drilling mud, it now being realized that this is one of the most important factors in rotary drilling, since poor mud nearly always leads to disaster in one way or another. As an open hole is carried for close to 5,000 feet the importance of the mud is readily seen, especially where cavey shales are encountered which have to be mudded off. In the Turner Valley no mud conditioners are used as good clay can be obtained from certain surface beds in the neighbourhood. The mud prepared from this clay is relatively free from sand and is mixed in boxes by means of steam jets which bubble through the mud and agitate it. Since well pressures in the Turner Valley wells are not now excessive no weighting material is added to the circulating fluid.

Completion Methods

Cable tools.—After the production casing has been cemented and set in the limestone a Christmas tree is assembled. This usually consists of a master gate below the cross, and two side manifold valves with a drilling through valve on top. Another set of valves is rigged at the separator and operating pressures are regulated by these.

Every well is completed with a high pressure control head while drilling in the limestone and it is usually assembled when the first gas is encountered at the top of the formation. This head consists of a cap through which there passes a polished rod assembly, the cap fitting in to a special ring screwed to the casing and is held in place by four clamps. The complete control head is tested for working pressures up to 1,000 pounds and by regulating one of the manifold valves any desired pressure can be maintained inside the casing. By the use of this apparatus there is less chance of the tools being blown up and the drilling line kinked with probable loss of the tools. The usual pressure carried is in the neighbourhood of 500 lbs. and in some cases as much as 700 lbs.

As soon as the main gas horizon is met and a large flow of gas is obtained the well is allowed to blow wide open for a few hours to clean out the debris and then is turned into the separator and a back pressure carried at the well dependent on the areal closed-in pressure. Thus with cable tools the full potential gas and naphtha capacity is attained within the first few days of the well reaching the productive horizon.

Rotary.—After the production casing is cemented and set in the limestone a Christmas tree similar to that rigged up at cable drilled wells is assembled. In some of the most recent drilled wells, however, the well is drilled below the porous zones before the water is bailed out, the assembled Christmas tree only being placed in position when the bailing commences. Formerly when pressures were higher it was necessary to install the Christmas trees before the productive horizons were drilled. This practice was considered necessary to prevent the wells getting out of control.

In rotary wells where oil is used for circulating purposes it is not possible to recover all strata cuttings, the return oil being passed into the separator to remove the gas and permit the oil to be again circulated preventing recovery of the cuttings. Drilling with oil circulating fluid is somewhat slower than with water, but considerable time is gained by the well being brought in in a clean condition and the production at once obtained.

With the possible exception of one well the use of water as a circulating method has had a detrimental effect on the initial production. In the new area the productive zones are below 5,000 feet and some at 6,000 feet. Thus the pressure exerted by water head against the face of the productive horizon at a depth of 5,000 feet is about 2,170 pounds without taking into consideration the pump pressure of 500 or 600 pounds. It will, therefore, be readily appreciated why formations with a rock pressure of less than 1,880 pounds will take water when there is such a differential pressure. It is reasonable to assume that the very porous and fractured strata will take water easily and water will undoubtedly travel further into the formation. Some of the recently drilled wells have taken from 500 to 600 barrels of water per day and over the period of drilling up to 5,000 barrels have been lost.

What effect the lost water has in the formations, has been for some time a subject of much controversy. It will, however, be seen that before maximum production can be obtained at any rotary drilled well this water has to be expelled from the formation. Initial bailing and frequent blowing thereafter brings some part of it out as it has been noted that during the first period of production the amount of naphtha increased after each time the well was blown.

In addition to the water that is forced back into the formation there is also the possibility that the fine particles of cuttings may be carried along with the water and thus tend to partially plug the pores and impede the free gas flow. It has also been suggested that the water may freeze at points back in the formation. It is difficult to appreciate how this can occur during the drilling operations but it is possible during the frequent and long blow downs which are necessary after the well is brought in. However, when such freezing does take place it is eventually thawed out by the application of pressure over a few days. Engineers who have had oilfield experience in other parts of the world have recommended that rotary drilled wells when approaching productive formations should be converted to dry percussive drilling. This suggestion, although slightly increasing the ultimate cost of the well, would certainly remove the danger of drilling water intrusion. Great improvements have recently been made in portable spudding machines and if these could be fitted with larger drilling cable spools they might be adapted for completing rotary wells and would considerably reduce the extra cost for installing percussive tools.

March 12th, 1935.

EXHIBIT D

NATURAL GAS IN ALBERTA

BY F. K. BEACH, OFFICE ENGINEER, PETROLEUM AND NATURAL GAS DIVISION

Man has used fire for ages and to the races who live in temperate climates with cold winters, the labour of collecting fuel has been a fairly large proportion of the whole business of living. If to the collection of fuel is added the carrying out of ashes and cleaning up of dirt occasioned by fires, quite enough of woman's time as well as man's is accounted for. The felling of trees, sawing them up, splitting, piling, letting them season, hauling in and bringing to the house as needed, is still the winter chore of man wherever trees are plentiful enough for that use. In other places coal takes the place of wood for fuel, reducing drudgery for the man of the house, but without reducing woman's work materially. Where natural or artificial gas is available, woman's work is materially lightened. Artificial gas is usually too expensive to use for house heating, but natural gas generally can compete with coal. If not actually reducing

the heating bill, it does not in most cases increase the cost of heating very much over the cost of heating by coal. As a consequence, natural gas finds a market, limited for the most part by the pipe lines available.

Electricity for lighting power, etc., is less expensive to carry long distances than is gas, for it can be carried on wires strung on poles while gas requires pipes, usually buried underground. As a consequence, not every house in a town can economically be supplied with gas even if there is gas in the town. The distribution is usually limited to the portions more thickly built up. Unlike electricity, however, the cost of connecting to a main transmission line is comparatively cheap, and small communities close to such main pipe lines can get this utility.

At the 1931 census Alberta had a population of 731,605. A total of 204 cities, towns and villages housed 38% of the total (279,252) and of these, 32 centres of 1,000 or over totalled 31½% (229,915). Natural gas is distributed in 26 centres having a population of 202,749. If a pipe line were built from Calgary to Edmonton, 12,311 persons would be added in some 15 centres. If such a line were now available, the supply for Edmonton, at present drawn from Viking, could be drawn instead from Turner Valley, thereby reducing the amount of waste from that field and holding the Viking field as a reserve. In the map, Fig. 1, attached to this report, existing pipelines, gas fields and centres supplied with gas are shown as well as the centres between Calgary and Edmonton and centres of 1,000 and over in other parts of the province.

The housewife finds natural gas a most flexible servant. On a hot summer day heat is available just when and where it is wanted for cooking, and immediately the meal is cooked, the heat can be discontinued, while with coal or wood, the whole stove gets hot when perhaps all that is required is to boil a kettle, and heat continues for some time after the immediate demand has been satisfied, to the discomfort of those who are in the kitchen. Fig. *2a* illustrates the variation in total demand in a gas system at different times in a summer day, and *2b* covers demand during a very cold winter day. *2a* starts at 8 a.m. of a midsummer Sunday. The morning peak comes between 10 and 11 when Sunday breakfast is being prepared. A small increase in load appears between 5 and 6 p.m. Some small demand continues throughout the night, keeping water hot in many houses, supplying bakeries that are making Monday's bread, keeping up steam in boilers of industrial plants, etc., and on Monday morning preparations for breakfast start around 6 o'clock. *2b* is a holiday in cold weather (Christmas) and at 8 in the morning the houses are being warmed up, the peak coming between 9 and 10. A small peak between 5 and 6 p.m. probably arises from a cooking load, small in comparison with the heating load. Toward midnight the gas is cut down somewhat as people go to bed, and again around 6 in the morning the load goes up as people rise. The morning is not quite so cold as the previous morning, and the demand at 8 a.m. is not quite so great as on the previous day. Both of these charts are of the Edmonton demand, and *a* and *b* are to the same scale.

Figure *3* shows over a year's record, the relation between temperature and gas demand for the Calgary-Lethbridge system. During the winter months every drop in temperature is reflected by an increase in load. Included in the daily input to the system is gas for storage at Bow Island, about 5,000 M.c.f.* per day. During the first two weeks of August this was cut off during the annual overhaul of equipment and test of the results of storage, and the line showing input to the system for this period represents normal demand. Storage was discontinued for two or three days in December when the weather was most severe. If we had shown hourly variations in demand, the line representing

input would have much more severe fluctuations and on Dec. 24 would have reached 61,270 M.c.f.* per day as the rate for the peak hour.

Included in the input shown is gas imported by the gas company for use in the Calgary oil refinery and amounting to about 2,500 M.c.f.* per day. If we deduct this from the summer months' graph, we note that the system must be large and strong enough to handle 60,000 M.c.f.* per day although the demand for any one day may fall as low as about 3,000 and may not run over 4,000 M.c.f.* per day from customers of the company for a month or more in midsummer.

Fig. *4* attempts to give a picture of relative amounts of gas used in various ways and places and the general trend of demand over the past 5 years. In it all daily and monthly peak demands are washed out. Two general types of demand are recognized. Demand connected with the oil and gas producing industry itself is plotted downward from a zero line to distinguish it from demand by consumers of the producing end of the industry. The fiscal year ending March 31 has been used owing to the fact that it does not cut into each winter's demand. In the Calgary-Lethbridge system, the demand appears to vary slightly with the intensity of cold weather in any winter. In the Edmonton system, competition from coal produced locally appears to have some effect on the total sales, as well as intensity of cold weather.

At Medicine Hat and Redcliff a number of industries have been closed during depression years. Here it is possible that estimations for the earlier years were slightly optimistic. More gas is now being metered than was the case in the earlier years shown in the figure.

It will be noted that 12,000,000 M.c.f.* per year is approximately the present requirement for all purposes except those connected with drilling and production of oil in Turner Valley and for storage against a time when gas will be required.

Gas Supplies for Alberta

Probably the largest supply of gas within the British Empire was contained in Turner Valley when Royalite 4 drilled into the limestone in October, 1924. Since then, approximately 700,000,000 M.c.f.* have been withdraw in order to recover naphtha occurring with the gas. If the fuel had been produced primarily for gas, the withdrawals to date would have met the present demand in the entire province, except fuel used for drilling, for some 58 years, even if all other sources had been closed in, or if used only for the Calgary-Lethbridge system it would have lasted 100 years. As things stand, it is difficult to say how long the Calgary-Lethbridge system will be oble to obtain a supply from Turner Valley. A part of the field has been closed in, and this action will make gas available for some time longer than would otherwise have been the case.

It is usual to draw conclusions respecting probable reserves in a field by observing pressure decline in connection with gas already withdrawn. Fig. *5* shows graphically the pressure decline in the principal fields that have been drawn on except for Turner Valley.

Note that Bow Island dropped from 745 when first drawn on in 1912 to 218 in 1920, and was then no longer able to supply Calgary. Repressuring started in 1930, using gas from Turner Valley injected through wells which had been used to withdraw the original supply, compressors being installed to increase the pressure. Gas to the extent of some 5,000 M.c.f.* per day has been injected, the total quantity to the end of 1934 amounting to about 7,350,000 M.c.f.,* or enough to carry normal demand in the Calgary-Lethbridge system for about one year.

Pressures at Medicine Hat and Redcliff appear to show an increase since 1930. This is in part due to several wells which proved an extension to the field at higher pressure than existed in the older portion. In part it is due to repairs to leaky wells, and possibly in part to previous erroneous pressures as a result of loading by water standing in the casing of some of the wells. This last feature is brought out in the graph for Viking. The drop from 1928 to 1929 appeared large. In 1930 pressures were observed before blowing to remove any head of water standing in the well, and again after blowing. The pressure after blowing shows that 1929 average was slightly erroneous. In some 11 years use about 10 years of ordinary Edmonton demand has been drawn from Viking field, and the closed pressure has dropped approximately 1/7 from its original amount. If 2/7 of the original pressure will remain when the field can no longer supply Edmonton, there remains 4/7 of the original supply, sufficient for say 40 years to come, if used only for Edmonton and population tributary to present pipe lines. The Kinsella field, about 10 miles east of Viking, is probably larger in content than was Viking at the start and other possible sources of supply are known in the country tributary to Edmonton.

Prospecting in the southern part of the province tributary to the Calgary-Bow Island pipeline has not yet yielded any noteworthy reserves. Foremost is a standby for the present system, but it is probably of only limited content. Therefore, as matters stand it appears possible that gas for the Calgary-Lethbridge system may have to come from the north when Turner Valley has been depleted.

February 28th, 1935.

*M.c.f.—Thousand cubic feet.

Fig. 1.

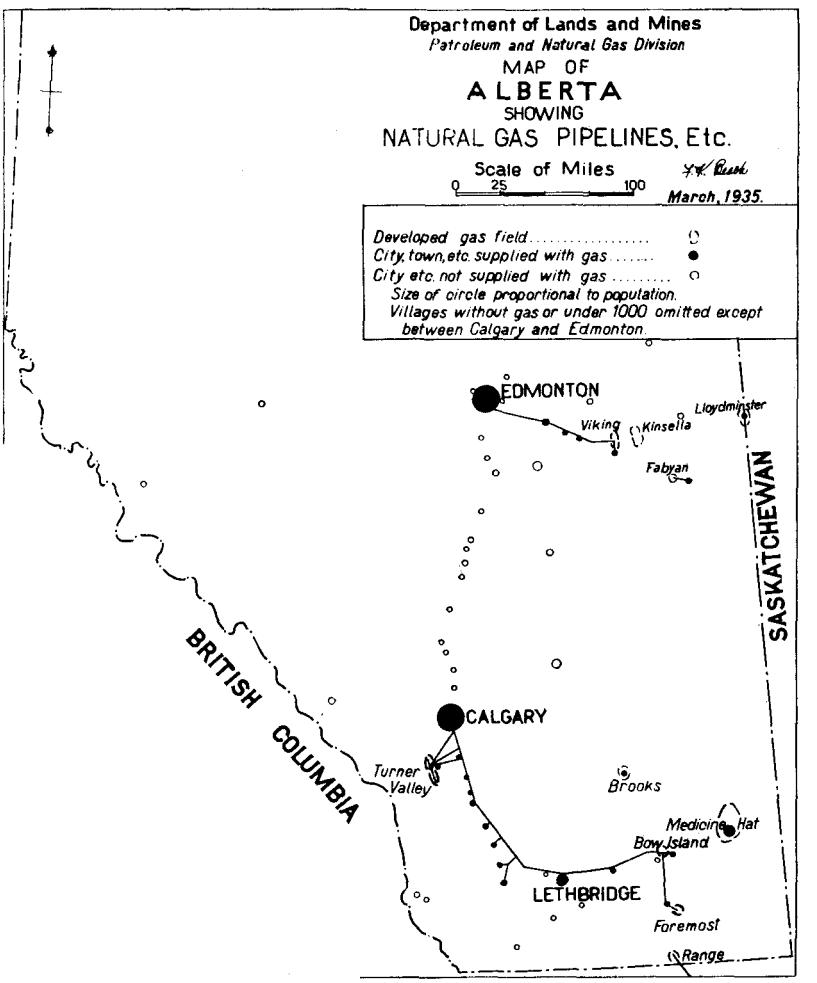

Department of Lands and Mines
Petroleum and Natural Gas Division
MAP OF
ALBERTA
SHOWING
NATURAL GAS PIPELINES, Etc.
Scale of Miles
0 25 100
March, 1935.
Developed gas field
City, town, etc. supplied with gas
City etc. not supplied with gas
Size of circle proportional to population.
Villages without gas or under 1000 omitted except between Calgary and Edmonton
EDMONTON
Lloydminster
Viking
Kinsella
Fabyan
SASKATCHEWAN
BRITISH COLUMBIA
CALGARY
Turner Valley
Brooks
Medicine Hat
Bow Island
LETHBRIDGE
Foremost
Range

Fig. 2.

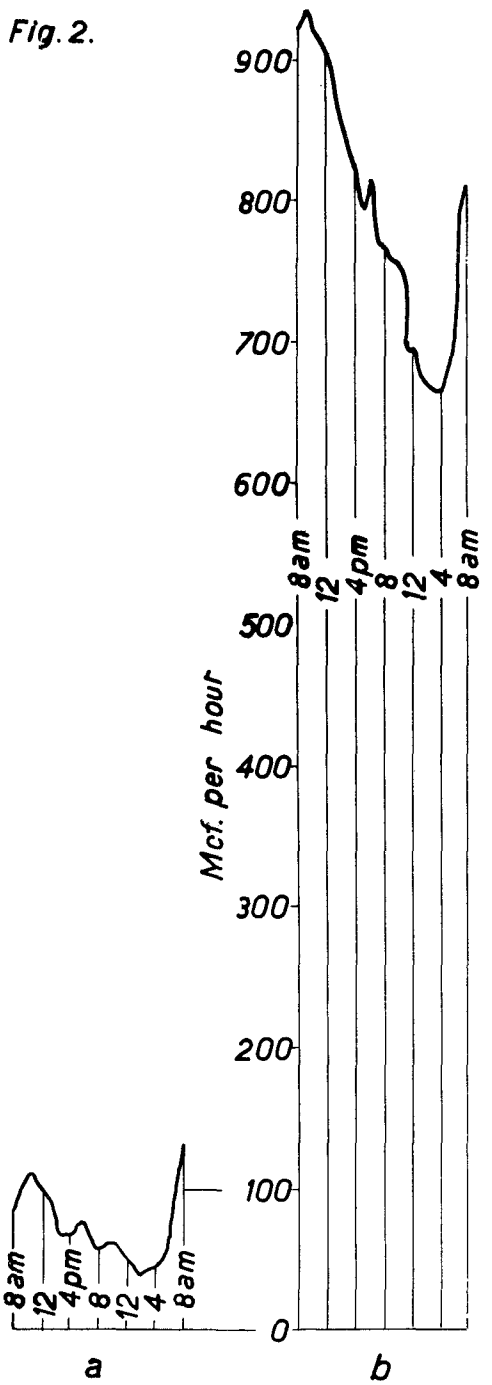
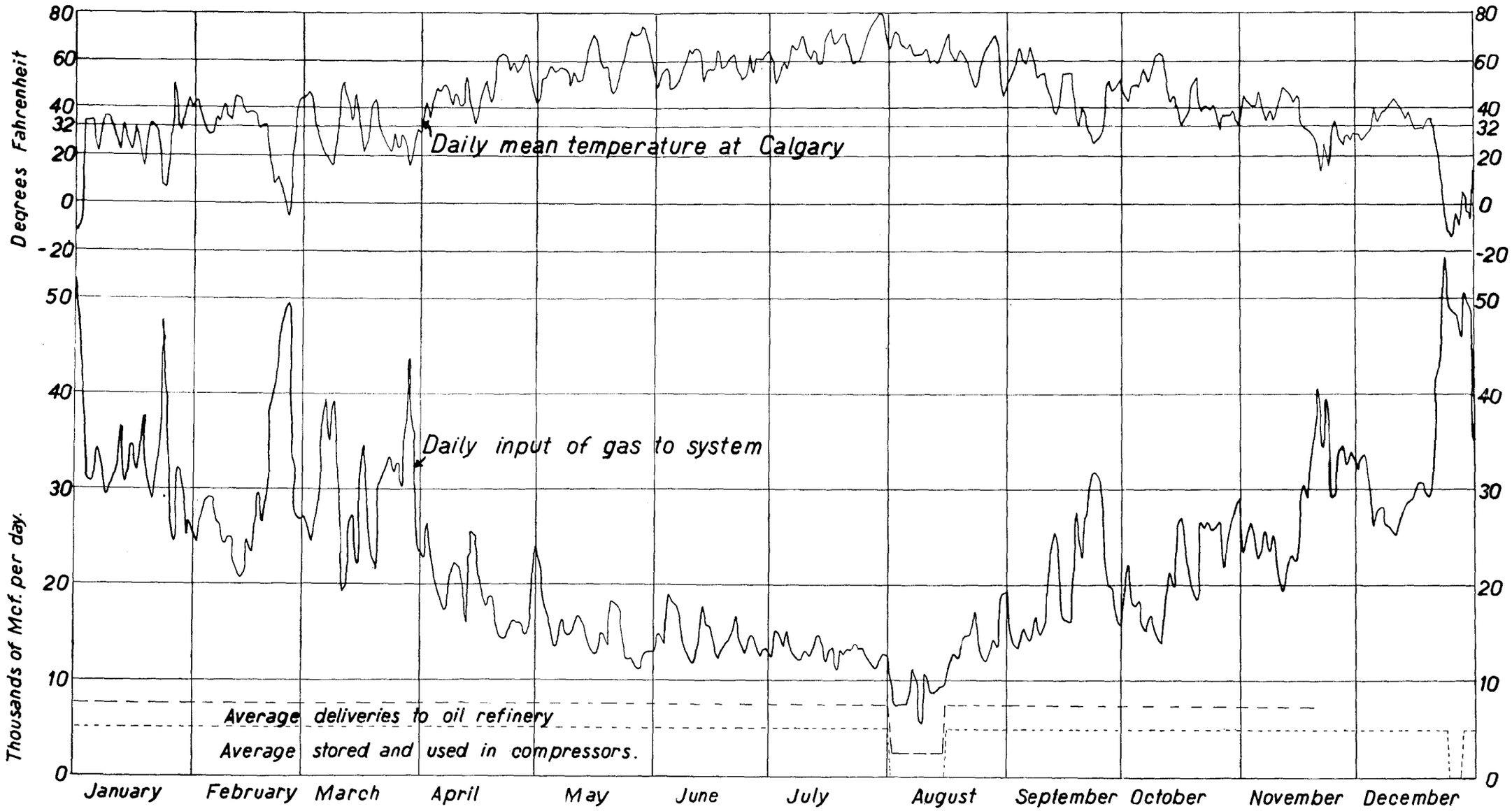

900
800
700
600
500
400
300
200
100
0
Mcf. per hour
8 am
12
4 pm
8
12
4
8 am
a
b

Fig.3

GAS DEMAND IN CALGARY-LETHBRIDGE SYSTEM, 1934 AND ITS RELATION TO CALGARY TEMPERATURE.



GENERALIZED TREND OF GAS DEMAND IN ALBERTA

Fig 4

Years ended March 31st

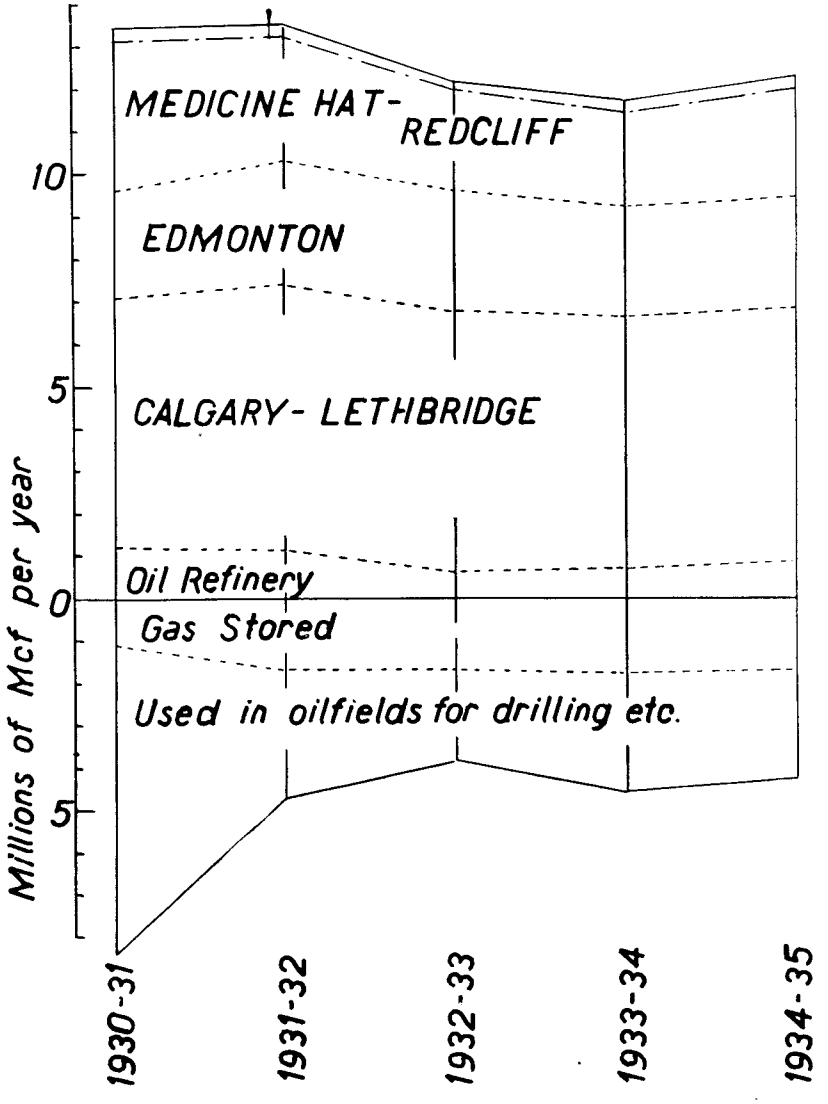


Fig. 5.

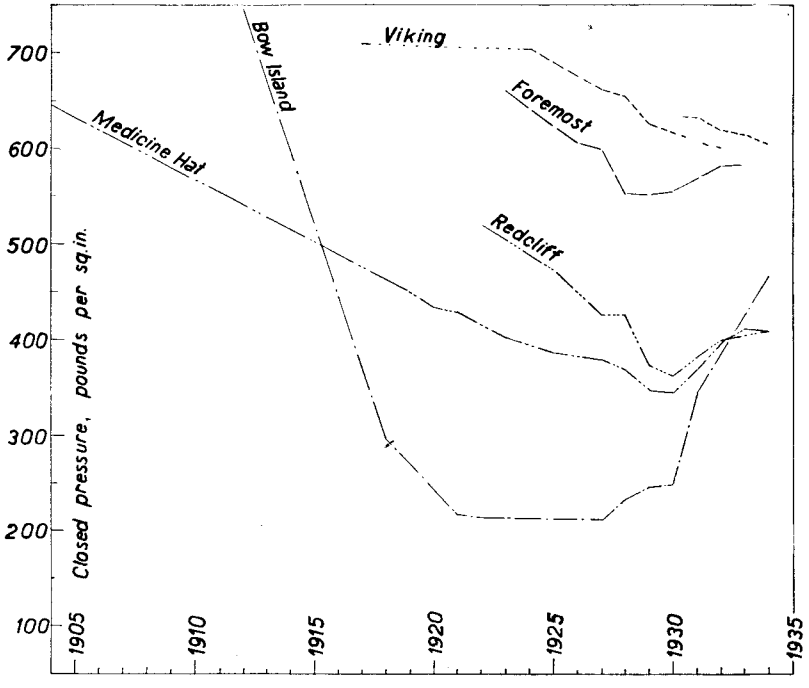

Viking
Bow Island
Foremost
Medicine Hat
Redcliff
Closed pressure, pounds per sq.in.
700
600
500
400
300
200
100
1905
1910
1915
1920
1925
1930
1935

EXHIBIT E

WAINWRIGHT OILFIELD

BY. R. M. S. OWEN, ASSISTANT ENGINEER, PETROLEUM AND NATURAL GAS DIVISION

Location.—The Wainwright oilfield is situated in townships 44 and 45, ranges 6 and 7, west of the 4th meridian in the eastern part of central Alberta at a distance of approximately 120 miles south-east of the City of Edmonton, on one of the main lines of the Canadian National Railways.

History.—Drilling started in the field during 1922. To date a total of 32 wells has been drilled of which 11 have produced oil, 7 are suspended and 6 were abandoned near the oil horizon while 8 did not drill sufficiently deep to test the oil zone.

The Wainwright oil field has been essentially developed by the rotary method, only 5 wells employing cable tools. Of the latter number three were not drilled sufficiently deep while the remaining two were both brought in as producers, a significant fact when comparing the efficacy of the two drilling methods.

Geography and Geology.—The country around Wainwright consists of gently rolling prairie cut through by the Battle River and its tributaries. The surface is nearly entirely covered by glacial deposits, hence structural determinations are largely based on the few exposures revealed in river channels, supplemented by a study of the bends in Battle River, some of which appear to be controlled by structural features in the underlying rocks. With the drilling of wells, sample evidence collected has largely helped to delineate the structure. According to Dr. G. S. Hume (1), two major folds cross this general area, namely the Fabyan and Battle River-Wainwright, trending in a general north-westerly to south-easterly direction. An underground structure contour map constructed on the base of the Benton formation shows that the strata have a general rise in a north-easterly direction from around 150 feet above sea level in the neighbourhood of the Wainwell wells to about 230 feet above sea level in the north-east part of the field or about 80 feet in about 5 miles. There is some evidence for the existence of terrace structures while the north-eastern part of the field appears to show slight doming and closures. Although subsurface evidence from many of the early wells is very meagre and of doubtful interpretation there is nothing to indicate a limitation to the extent of the field at present especially in an easterly and northerly direction.

The geological succession of formations is as follows:

Formation	Thickness, Feet	Description
Pale beds	500	Pale coloured sandstones and green shales: little ironstone and coal. Fresh water.
Variegated beds	200	Interlayed sands and shales with thin coal seams. Fresh water.
Birch Lake	60-100	Massive buff sandstone with some shales. Mainly brackish water deposits.
Grizzly Bear	40-100	Mainly dark blue grey marine shale: some sand beds present.
Ribstone Creek	225	Mainly sandstone with little shale, part carbonaceous. Brackish water deposits.
Lea Park-Benton	1,500-1,550	Marine dark grey shale. Some sandstone beds (gas bearing) particularly near base.
Lower cretaceous beds	270-310	Mainly sandstones (oil bearing) with some shale. Continental deposit.
Devonian beds	.....	Marine limestones and small amount of green shale.

LIST OF WELLS IN WAINWRIGHT FIELD

Well	Location*	Drilling Method	Date Commenced	Depth (Feet)	Depth to Top of Lower Cretaceous (Feet)	Status
Admiral, No. 1	16 of 36-44-7-W4	R	1929	2,698	2,055	Suspended
Atkins, No. 1	9 of 18-45-6-W4	R	1931	310	.....	Suspended
Beaument, No. 1	1 of 10-45-7-W4	R	1929	2,183	2,035	Producer
Bethwain, No. 1	13 of 6-45-6-W4	R	1929	2,485	2,063	Producer
Bethwain, No. 2	16 of 4-45-6-W4	R	1929	2,305	2,133	Suspended
British Petroleum, No. 1	1 of 36-45-7-W4	R	1922	2,017	1,975?	Abandoned
British Petroleum, No. 2	13 of 30-45-6-W4	R	1923	2,038	2,020?	Suspended (Gas Well)
British Petroleum, No. 3	4 of 29-45-6-W4	R	1924	2,296	2,098?	Abandoned
British Petroleum No. 3B	4 of 29-45-6-W4	R	1925	2,259	2,100?	Producer
British Petroleum No. 4	13 of 30-45-6-W4	R	1924	2,036	2,025?	Suspended
British Wainwright, No. 1	13 of 20-45-6-W4	R	1926	2,238	2,074?	Producer
Edalta, No. 1	15 of 19-45-6-W4	R	1929	2,225	2,084	Producer
Edmonton Wainwright, No. 1	4 of 29-45-6-W4	R	1926	2,274	2,100?	Producer
Emerald, No. 1	8 of 30-45-6-W4	R	1926	2,425	2,125?	Abandoned
Lloyds Petroleum, No. 1	12 of 6-45-6-W4	R	1930	323	.....	Abandoned
Mid-Canada, No. 1	7 of 13-45-6-W4	R	1927	175	.....	Suspended
Montreal Alberta, No. 1	2 of 15-45-7-W4	R	1931	2,885	2,060?	Suspended
National Exploration, No. 1	1 of 30-45-6-W4	R	1927	2,268	2,100?	Abandoned
Onalto, No. 1	8 of 20-45-6-W4	S	1929	2,232	2,058	Producer
Peninsular, No. 1	16 of 30-45-6-W4	S	1930	234	.....	Abandoned
Sasko-Wainwright, No. 1	1 of 19-45-6-W4	R	1928	2,250	2,116	Producer
Senator, No. 1	1 of 23-44-6-W4	R	1930	708	.....	Suspended
Wainwell, No. 1	9 of 36-44-7-W4	S	1924	2,225	2,068	Producer
Wainwell, No. 2	15 of 36-44-7-W4	S	1928	525	.....	Abandoned
Wainwell, No. 2A	15 of 36-44-7-W4	R	1928	2,033	2,029?	Suspended
Wainwell, No. 3	9 of 36-44-7-W4	R	1928	2,072	2,064	Suspended
Wainwell, No. 4	15 of 36-44-7-W4	R	1929	2,053	2,037	Producer
Wainwright Dome, No. 1	7 of 31-45-6-W4	R	1926	2,308	2,130?	Abandoned
Wainwright Oil Development, No. 1	15 of 36-44-7-W4	R	1922	218	.....	Abandoned
Wainwright Petroleum, No. 1	6 of 30-45-6-W4	R	1929	2,252	2,120?	Producer
Western Consolidated, No. 1	8 of 20-45-6-W4	S	1924	1,360	.....	Abandoned
Western Consolidated, No. 2	11 of 30-45-6-W4	R	1926	2,232	2,076?	Abandoned

N.B.—In the above table "R" indicates rotary drilled wells and "S" those drilled by standard cable tool method.

*Figures under this heading represent l.s.d (legal subdivision), section, township, range and meridian. The first description, Admiral, No. 1, would therefore read l.s.d. 16 of section 36, township 44, range 7, west of the 4th meridian.

PRODUCTION:

To the end of 1934 Wainwright had produced 69,662 barrels of oil and 11 wells, two of which have produced over periods of nine and six years respectively an amount equal to 62.9 per cent of the total oil production of the field.

PRODUCTION DATA

Well	1926	1927	1928	1929	1930	1931	1932	1933	1934	Total
British Petroleum, No. 3B	4,350	1,314	5,530	5,540	1,670	265	759	894	2,075	22,397
Edmonton Wainwright	1,631	1,212	1,405	1,326	2,281	1,499	407	119	1,522	11,402
Wainwell, No. 1			1,017	758	.....	.....	.....	.....	.....	1,775
Wainwell, No. 4				1,010	1,278	.....	.....	.....	.....	2,288
Sasko-Wainwright				3,548	3,996	3,912	3,485	3,018	3,438	21,397
British Wainwright				150	346	.....	.....	.....	343	839
Onalto					168	1,070	2,199	310	2,882	6,629
Edalta						296	.....	56	646	998
Bethwain, No. 2						100	85	362	.....	547
Beaument (Gold Standard), No. 1								517	793	1,310
Wainwright Petroleum, No. 1									80	80
TOTALS	5,981	2,526	7,952	12,332	9,739	7,142	6,935	5,276	11,779	69,662

It will be observed from this tabulation that two wells have produced consistently for a period of nine years, while the Sasko-Wainwright well has produced on an average ten barrels a day for six years. However it will be noticed that most wells have not been allowed to produce continuously. This erratic production has largely been due to seasonal demand and the former inadequate refinery facilities together with the general idea of operators that anything less than a gusher did not warrant careful development. Only four wells, British Petroleum, No. 3B, Edmonton Wainwright, No. 1, Sasko-Wainwright, No. 1 and Onalto, No. 1 have been given anything like an adequate production test and it is thought that should the remaining wells be efficiently operated they could be made to maintain a production of at least ten to fifteen barrels of oil per day over a large number of years. One well came in with an estimated production of 250 barrels a day but the flow of oil became shut off owing to mechanical difficulties and was never recovered again.

Character of the Oil.—The oil produced at Wainwright belongs to the heavy crude class and has a gravity range of from 20 to 22 degrees Baumé. It is of a brownish-black colour and of a hybrid base. At present the crude oil commands prices ranging from 90 cents to $1.00 per barrel. An average laboratory distillation shows 5 to 16% gasoline, about 4% kerosene, 15 to 30% gas oil and 16 to 29% lubricants with a residue varying from 32 to 47%. A refinery recently completed has a capacity of over 200 barrels per day, the finished products comprising gasoline, three grades of distillate and diesel oil. An average refinery run on Wainwright crude gives about 7.5% gasoline (over 45° Be.), 14% No. 2 distillate (36 to 38° Be.) and about 28% diesel oil (27 to 29° Be.). Thus at present about half the product consists of bottoms for which no market has yet been developed. Even neglecting this potentially profitable by-product which should yield a considerable quantity of lubricating oil and asphalt, the net refinery profit without selling costs should equal approximately 75 cents per barrel. The addition of a cracking unit to the refinery would considerably increase the recovery of the lighter fractions from Wainwright crude oil.

Geologcial Section.—Most wells begin near the base of the Pale or the top of the Variegated beds depending on elevation of well and position on structure. Water sands are encountered in the Birch Lake sandstone at a depth of around 220 feet and again in the Ribstone Creek formation the base of which in most wells occurs around the 600 feet level.

Prominent gas shows occur about 600 feet below the top of the Lea Park shales while at about 950 to 1,000 feet below the base of the Ribstone Creek occurs a speckled shale zone which is tentatively taken as the contact between the Lea Park and Benton (Alberta shale) formations. A prominent bentonite bed occurs just below this horizon and appears to be a valuable marker in this homogeneous shale series. Two prominent gas horizons occurr respectively about 250 and 150 feet above the base of the Benton formation of which the latter is usually the more important. These lower gas horizons appear to correlate roughly with the Viking gas sand horizon. The base of the Benton is generally marked by a chert pebble horizon.

Although a few oil shows are found in the Benton it is in the underlying Lower Cretaceous formation that commercial production of oil is encountered. This formation is non-marine in origin and consists predominantly of sandstones with subordinate greenish grey shales with a few coal seams. Immediately below the base of the Benton at an average depth of 2,030 to 2,130 feet below the surface occurs the Wainwells sand which is generally oil bearing particularly

in the area in which the various Wainwell wells are located. The strata below this consists predominantly of oil sands while at a depth of around 120 feet below the base of the Benton occurs a coal horizon generally called the "B.P. 3" coal which appears to be fairly persistent throughout the field and serves as a useful marker. This coal overlies the sand from which most of the production of the field is obtained. The thickness of the various oil sands encountered varies considerably due to the geological conditions under which they were deposited and most of the sands contain thin streaks of shale. Rapid lateral variation in grain size appears to be the general rule and the resulting porosity appears to be a controlling factor in the well's productivity. Operators have contended that low down in the Lower Cretaceous water is present in some of the sands. This opinion, however, is at present unconfirmed, but in order to safeguard new wells and obtain waterfree oil it is advisable that the Lower Cretaceous strata should not be too deeply penetrated. The rotary system of drilling, almost universally employed, in which the drilled hole is of necessity constantly full of drilling fluid, has made the exact location of this probable connate formation water a matter of doubtful speculation. Suffice it to state that the cable tool wells penetrating this section have been practically water free. The thickness of the Lower Cretaceous varies between about 270 and 310 feet and the most highly saturated sands appear to be in the upper half of this section.

There is evidence that there may be thin marine intercalations in the Lower Cretaceous in this area, possibly representatives of the marine Clearwater Shales to the north, and this intermixture of continental and near-shore deposits provides an environment considered to be favourable for the formation of oil over a large area in eastern central Alberta.

Only three wells in the area have penetrated the complete Lower Cretaceous section and entered the underlying Palaeozoic limestone. Oil staining has been encountered near the top of this formation but one well has drilled the limestone for a thickness of 550 feet without encountering production. Some porous zones were met, however, in the limestone and it is possible that these horizons may be oil bearing at other locations.

Drilling Methods.—The general procedure in the case of rotary wells is to set and cement 12½" casing at the top of the Lea-Park shales at an average depth of close to 700 feet thereby shutting off all surface waters. Thereafter it is usual to run 8¼" casing to the base of the Benton or to set it just above the oil sand to be tested. Cable tool wells usually set a large diameter casing near the surface, 15½" or 12½" at the top of the Lea-Park and 8¼" or 6¼" close to the oil sand. An intermediate string of probably 10" casing may be set and subsequently pulled. There appears to be no doubt that the rotary system provides a saving of time and casing whilst drilling to the base of the Benton formation but it appears equally true that subsequent drilling through the oil sand series should be conducted by cable tool methods in order to ensure precise knowledge as to the position and vertical extent of the various oil sands encountered and hence the ability to determine the exact depth of any possible connate water horizon. In regard to the last statement it may be mentioned that records of the earliest wells drilled in the field show that in many cases (before Government supervision was introduced) casings in wells were not cemented with the consequence that surface waters had ample opportunity to seep down into and penetrate the lower horizons. A large part of the trouble in wells producing both oil and water may have been due to this cause.

Future Development of the Field.—As may be seen from the map attached to this report only a small part of the field has been actually drilled and there is

ample room for many more wells, even within the developed area and close to the largest producers, all of which if drilled efficiently should produce commercial quantities of oil. Besides this, since the field has not been delimited in any direction good prospects exist for the bringing in of larger wells should some progressive operator prospect outwards from the present area of production.

In the past, as before stated, nearly all the wells have been drilled entirely by the rotary method. The necessity of having the hole full of water and the consequent pressure exerted by this column has resulted in many oil and gas horizons being passed by unnoticed.

Inadequate storage facilities have proved a great hindrance in the past resulting in crude oil being allowed to accumulate in earthen pits with consequent deterioration in the quality of the oil, losses through evaporation and contamination with rain water.

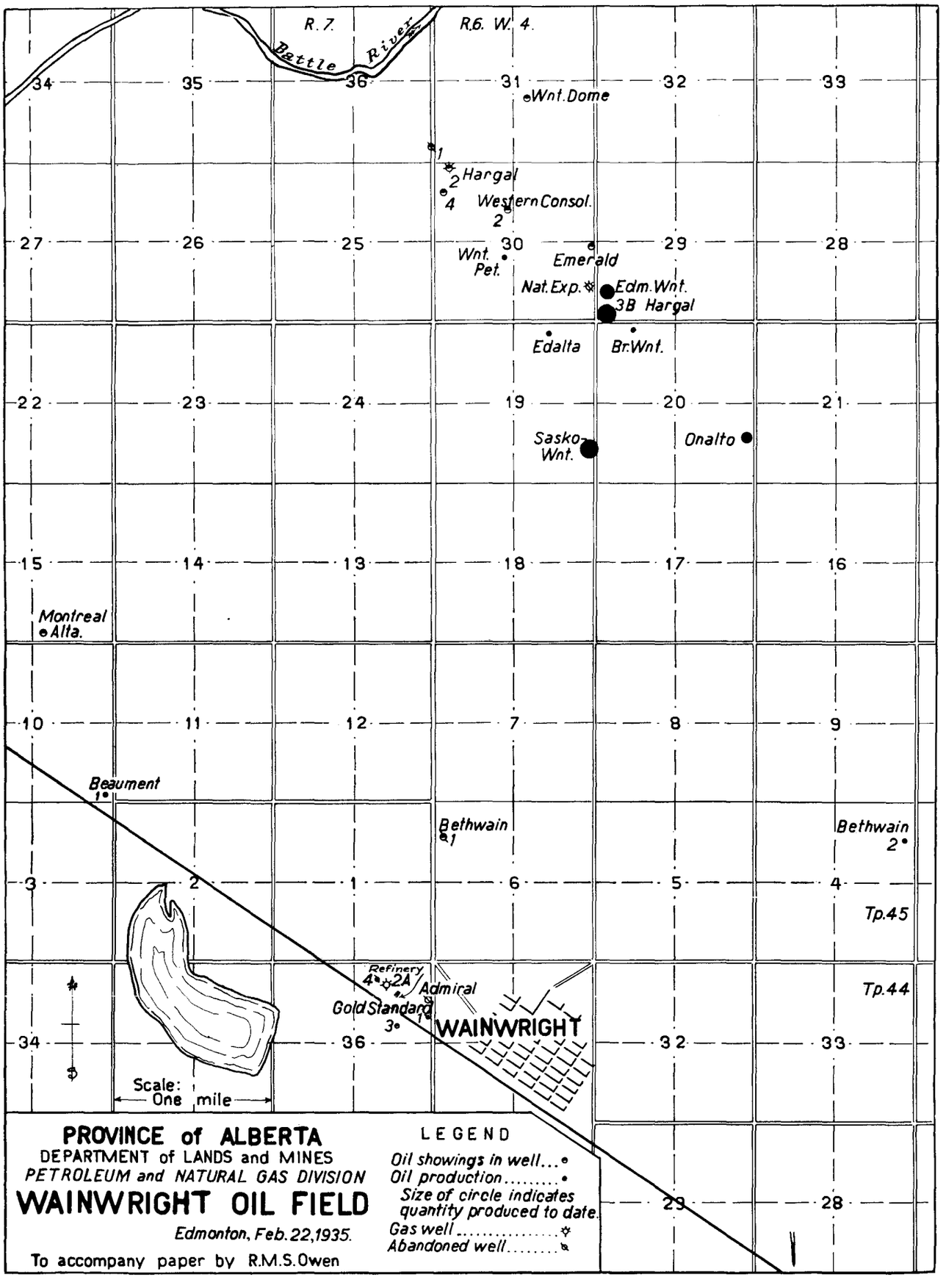
Future economical development of this field would appear to be in the direction of a scientific distribution of numerous wells around a central pumping plant, thereby cutting down on operating costs and ensuring a sufficient number of holes to enable the oil horizon to be adequately drained of its heavy oil content. Repressuring of the oil sands through key wells with the gas encountered higher up in the section would appear to be a possible means of obtaining greater production of lighter gravity oil than hitherto obtained.

In conclusion it is apparent that the future profitable exploration of the Wainwright oil field rests in the formation of a few large companies sufficiently financed to drill a series of wells under efficient engineering and geological supervision and the extension of refinery facilities so as to yield a greater percentage of marketable products.

BIBLIOGRAPHY

1. Hume, G. S., Summary Report, G.S.C., 1924, part B, pp. 1-22.
2. Hume, G. S., Summary Report, G.S.C., 1925, part B, pp. 14-15.
3. Allan, J. A., Scientific and Industrial Research Council, 4th Annual Report, 1923, p. 54.
4. Calder, W., Canadian Institute of Mining and Metallurgy, November, 1932, pp. 632-640.
5. Schedule of Oil and Gas Wells, Department of Lands and Mines, Province of Alberta, Edmonton.

March 7th, 1935.


R.7.
R.6. W. 4.
Battle River
34
35
36
31
32
33
Wnt. Dome
1
2 Hargal
4
Western Consol.
2
27
26
25
30
29
28
Wnt. Pet.
Emerald
Nat. Exp.
Edm. Wnt.
3B Hargal
Edalta
Br. Wnt.
22
23
24
19
20
21
Sasko Wnt.
Onalto
15
14
13
18
17
16
Montreal Alta.
10
11
12
7
8
9
Beaumont 1
Bethwain 1
Bethwain 2
3
2
1
6
5
4
Tp.45
Refinery
4
2A
Admiral
Gold Standard
1
3
WAINWRIGHT
Tp.44
34
36
32
33
29
28
Scale:
One mile
PROVINCE of ALBERTA
DEPARTMENT of LANDS and MINES
PETROLEUM and NATURAL GAS DIVISION
WAINWRIGHT OIL FIELD
Edmonton, Feb. 22, 1935.
To accompany paper by R.M.S. Owen
LEGEND
Oil showings in well...
Oil production.....
Size of circle indicates quantity produced to date.
Gas well.....
Abandoned well.....

Forestry

REPORT OF THE DIRECTOR OF FORESTRY, T. F. BLEFGEN

The responsibilities of the Forest Service for the fiscal year, 1934-35, were similar to those reported in the previous period with forest protection and timber disposal representing the principal duties.

Sales of tie timber showed an upward trend in the market but other classes of timber were down from the previous year. It is obvious that a favourable change in this industry cannot noticeably take place until there is a general betterment in basic conditions. In matters of utilization and slash disposal, a general improvement was in evidence during the year.

Forest protection efforts were continued on the same basis as in immediately preceding years, results during this period being considered reasonably successful, excepting in the southern part of the Province where a combination of conditions and circumstances resulted in serious losses and the expenditure of large sums of money for fire control purposes. From the Red Deer valley north the season was a very favourable one for forest protection and had the Service been so fortunate as to have had similar conditions in the south the season would have been outstanding in point of low damage and reduction of fire fighting costs.

It must be repeated that the effort towards economy which has led to a curtailment of the period of employment for the field staff has led also to grave difficulties in the matter of maintenance of systems of communication, which in turn has resulted in a dangerous situation in respect to the functioning of these systems at the time of the spring fire danger period. Likewise a grave danger to the safety of the forests is apparent through the above situation and through the fact that the field staff is not employed sufficiently early in the spring. The organization remains on the same basis numerically as shown in the previous report and there has been no change of importance within the organization.

A review of the year's wood operations again shows an increase in the number of small operations and consequently a further increase in timber inspection work. By temporarily transferring inspectors from divisions where the work in hand was not so heavy and by utilizing ranger services extensively on minor inspection work the situation was dealt with satisfactorily. This result was only obtained by working exceptionally long hours. Any increase in inspection work can anly be met by additional assistance for certain inspectors, otherwise the work will not be dealt with as desired, which may lead to a noticeable decrease in efficiency and most probably an undermining of health in individuals.

The forest nursery at Oliver is being developed in a very satisfactory way. The maximum development obtainable under the existing provision of labor supply is being reached and if an enlargement of this operation is undertaken it will be necessary to provide for additional labor supply from a source other than the Oliver Mental Institute.

Forest Protection

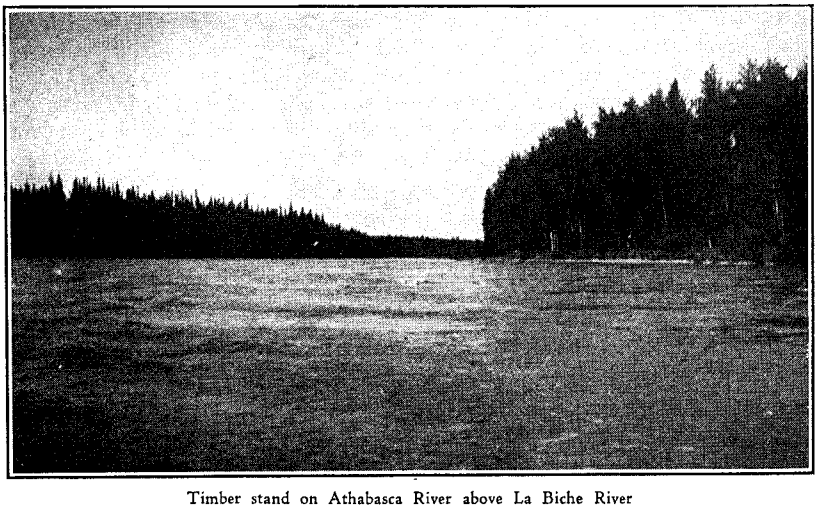
The situation with regard to destructive agencies other than fire remains as reported last year. Wind continues to cause considerable damage in the mature stands of spruce. A considerable number of present day logging operations takes place in such timber so that in so far as mature accessible stands are concerned it is expected that utilization will effect a fairly extensive salvage of wind-thrown

timber and the removal of the majority of this class of product prior to destruction by wind and decay.

Fire Season.—Precipitation over most of the province was lighter than usual during the winter of 1933-34. An early spring with an insignificant rain-fall ushered in the spring danger period which varied in length from a few days in the southern mountain and foothill region to one of several weeks duration in the northern plains region. During the spring danger period there were 144 fires with April contributing 25, May 107 and June 12, making up sixty per cent of the total fires for the year. June rains terminated this danger period over all forested territory excepting the southern region where precipitation was sub-normal and certainly far from adequate for assisting extensively in forest protection.

In the central and northern portion of the province heavy precipitation fell during the latter part of June and well on into July eliminating fire danger almost completely in this region during this period. During the summer period, however, southern Alberta with almost complete absence of rain and with strong dry winds, hot weather and low humidity experienced a critical danger period and one which the most destructive and costly fires occurred. The situation was most dangerous in the Crowsnest Pass district and the Cypress Hills Forest Reserve. Over the latter area in particular the snowfall of the previous winter had been very light and thus the season commenced with soil moisture below normal to be followed by drouth conditions during the spring and summer. The Cypress Hills Forest Reserve is situated at altitudes of from approximately 4,000 feet at the base of the hills to over 4,700 feet at the summit which is in the form of a plateau. Surrounded by the lower plains it will be evident that the area is particularly open to the effect of winds.

Unsettled weather, accompanied by light rains and snow, was general over almost all forested territory in September but the moisture was not sufficient to end the fire season definitely. In the northern part of the province fire danger existed until a genreal snowstorm occurred in mid-October which had the effect of terminating the hazard for this region. Over the foothills and mountain country the danger was not completely eliminated until about the middle of December.



Timber stand on Athabasca River above La Biche River

Fire Prevention.—Seasonal rangers and assistants were employed slightly in advance of the commencement of the fire season—a highly desirable proceeding. The staff was thus enabled to make some preparation for the immediate future, particularly to encourage burning of slash, under permits, by settlers during the safe period, to check up trails for winter fires, to re-open trails and to repair telephone lines and equipment.

It can be said that the early prevention work was very successful over those areas which rangers were able to cover during the short time at their disposal. To secure the maximum results it is necessary that the ranger staff be employed just as early as it is possible to travel.

The honorary fire guardians again provided valuable assistance in issuing burning permits.

The restriction on open camp fires over a defined area in the south-western part of the province was again in force and gave satisfactory results. As reported last year still better results could be looked for if the date on which this restriction becomes effective, August 1st, were advanced by two weeks or one month.

Additional improved camp sites were established, these improvements being confined to the Bow River division. With the limited funds available it is natural that this development is slow. It is hoped that when the importance of improved camp sites, provided with safe fire places, is more thoroughly proven that funds will be made available to deal with the situation adequately. Six camp stoves were erected during the year.

Again the officials and employees of the railway companies within the province rendered valuable co-operation in matters of fire prevention and suppression. The maintenance of fire preventive appliances on railway locomotives and other rolling stock is a matter which directly concerns the officers of the Board of Railway Commissioners for Canada. A very satisfactory degree of co-operation and assistance was received from this source and the small number of railway fires points to good maintenance practice.

BURNING PERMITS ISSUED IN ALBERTA
PRAIRIE FIRES ACT
1934

Forest Reserves:			
Crowsnest-Bow River	.....		
Clearwater	428		
Cypress Hills	.....		
Brazeau-Athabasca	9		
Sub-total		437	
Northern Alberta Forest District:			
Edmonton	110		
Edson	226		
Athabasca	77		
Bonnyville	.....		
McMurray	21		
Slave Lake	513		
Grande Prairie	392		
Peace River	46		
Sub-total		1,386	
Forest Service Total			1,823
Honorary Fire Guardians outside Municipal Districts		878	
Municipal Districts		308	
Royal Canadian Mounted Police		238	
Outside Agencies Total			1,424
Grand Total			3,247

PROSECUTIONS AND CONVICTIONS
PRAIRIE FIRES ACT
1934

	Instituted by Forest Service	Instituted by other agencies	Totals
Number of prosecutions	20	15	35
Number of convictions	18	11	29

The control of camping and travelling within the forest reserves by the issue of free camping and travelling permits and the control of burning operations for clearing land or other purposes by the use of free burning permits within and adjacent to forested territory in the Northern Alberta Forest District are two of the most effective measures evolved for fire prevention purposes. In view of the fact that almost all fires are caused by the carelessness, thoughtlessness or ignorance of human beings it will be evident that personal contact between the field officers and the public is of great value.

Fire Detection.—The fire detection system remained as previously reported with no expansion of intensive detection such as exists in the Rocky Mountain Forest Reserve or the Slave Lake Division. The lookout system operated at a high degree of efficiency excepting in the area south of the Crowsnest Pass where due to drift smoke from British Columbia, Idaho, Washington and Montana visibility was greatly restricted, which proved a great handicap to lookout men, especially at the time that the Castle River fire occurred. This fire originated in British Columbia.

During the year a new lookout tower was completed south of Whitecourt and another almost completed between Edson and the Athabasca River. Both are located on the highest points in the districts and give exceptional coverage. Arrangements were made for the construction of another tower at the head of the Lobstick River south of Carrot Creek. The site was examined and steel tower material sent forward from Edmonton. This material is from an 80 foot tower taken from an area no longer under forest protection. The erection of these additional towers has in view the control of territory within the Edmonton and Edson divisions of the Northern Alberta Forest District. As used at present such towers are of considerable value to the district rangers. Present efficiency, compared with that which would be received if the towers were manned by lookout men and inter-communication from tower to tower and tower to rangers established, together with suitable fire finding equipment at each tower, would rate not higher than one per cent.

Fire Suppression.—During the season the Forest Service dealt with 240 fires, 134 being fires covering less than 10 acres and 106 larger than that area. Of the latter number 27 exceeded 500 acres and it is on this group that the large percentage of fire fighting funds were expended. The Willow Creek fire within the Cypress Hills Forest Reserve and the Castle River, Pelletier Creek No. 2, and Bluff Mountain fires within the Crowsnest Division account for the major expenditures of fire fighting funds during the season, showing a cost including ranger labour of $28,765.62. The total expenditure for all fires including ranger labour was $38,169.02.

The particular fires mentioned originated when the summer fire danger period was at its height and every natural factor against control. In each instance the fires made fast headway in the early stages, entirely too quickly to be coped with had equipment and men been rushed to the spot in numbers exceeding those actually used.

The Willow Creek fire originated near the summit of the Cypress Hills plateau and close to the head of Willow Creek. It spread so rapidly that the initial crew was altogether inadequate on arrival at the fire. Through the interference of some person unknown an unauthorized labour supply greatly in excess of requirements was requisitioned from Medicine Hat. This labour supply arriving as it did at various times of the day and night was without supervision for a short period, for those in charge were working day and night in an effort to control the fire and had no knowledge of the large excess of

men who were arriving and dispersing on to the fire line. Crew numbers were reduced as soon as the situation became apparent but in the meantime large commitments in labour service and supplies had been made. This briefly explains more than anything else the cost of this fire which must be admitted to be excessive. The importance of the Cypress Hills forest is so well recognized by the residents of the district that assistance was readily forthcoming. Unfortunately the enthusiasm of a very few contributed in no small way to disorganization in the early stages of the operation and to the excessive man power placed at the fire.

The major part of the timber killed by this fire will be disposed of by permit and thus a fairly complete salvage is anticipated. Trees that had not reached a usable size will be a complete loss and due to accessibility this material only will represent the major tree loss. The burned over area which was carrying a growth of lodgepole pine will reseed to this species naturally. Regardless of the needlessly heavy expense incurred in gaining control of this fire it should be understood that with the prevailing weather conditions it is fortunate that the destruction was not much more extensive. Had the fire broken to the north side of the hills it is conceivable that little would remain today of the green timber of the Cypress Hills. Fortunately spreading in this direction was checked.

The Castle River fire while occurring in the same period was an entirely different problem. The fire originated in British Columbia and it is reasonably well known to have started from the carelessness of campers who had left other fires behind in their travels. Originating as it did in British Columbia it was outside the jurisdiction of the Alberta Forest Service and unless it spread so as to be a menace to timber in Alberta suppression action by the Alberta Forest Service was not justified. There was no such action taken by the British Columbia Forest Branch, with the result that the fire spread unchecked and, reaching a favourable part of the main range of the Rocky Mountains, crossed into Alberta. Prior to this the fire had been under observation and it was decided, when it appeared that the fire threatened Alberta timber, that measures be taken to prevent its spread into this province. These measures were not successful and it became necessary to fight the fire in Alberta.

Conditions for detection and suppression were most difficult at this time. There were many large fires burning in British Columbia, Washington, Idaho and Montana and drift smoke from these rendered detection and close location from the lookouts very difficult. The fact that so many large fires were burning in nearby territory and that these spread despite the efforts of more highly organized and better equipped protection organizations only emphasizes the conditions that obtained at the time of the Castle River fire.

The history of this fire from the time actual fire fighting commenced was one of attack and defeat until finally when weather became somewhat favourable control was gained. In the meantime, a large area of inaccessible mature and over mature timber was fire-killed. While the pine stands will re-seed naturally it will be many years before the spruce stands become re-stablished and in the meantime an important watershed has been denuded of forest cover.

Suppression costs on this fire were large but are to a great extent justified in defence of valuable blocks of merchantable timber held in timber berths.

Fire suppression action on any large fire is usually open to criticism and this fire is no exception. From the time that actual fire fighting operations commenced, and this does not include the attempt to confine the fire to British Columbia, the action was reasonably satisfactory. It is only necessary to

envisage the region and problem, the strain and conditions under which men are forced to work, to understand that decisions may sometimes be faulty and that the seemingly impossible is often attempted. In reviewing the successes and the failures of other similar organizations which have had a greater opportunity to train personnel, have a much greater supply of up-to-date equipment, smaller areas to cover per man and all around better organization in the way of fire protection, communication, roads and trails, it is apparent that the field officers of the Alberta Forest Service in general need not suffer by comparison.

Causes.—A review of the causes of fire will indicate the sources of danger to Crown timber. Some fluctuation will be noted from season to season and under existing conditions of organization it can be said fairly definitely that such fluctuation is due to a change in conditions affecting any particular cause. For instance a wet season in newly settled areas will show a reduction in settlers' fires or again the early advent of winter will show a reduction in fires started by campers.

COMPARISON OF FIRE CAUSES BY PERCENTAGE

Causes	1931	1932	1933	1934
Campers	23.7	52.8	38.9	35.4
Smokers	3.2	5.3	13.5	11.7
Settlers	21.9	17.1	17.4	17.9
Railways	6.6	4.5	2.8	5.0
Lightning	.6	2.6	5.2	7.5
Industrial Operations	1.9	1.1	1.7	4.2
Incendiary	15.1	8.2	11.8	11.2
Public Works	1.4	.5	1.4	1.3
Unclassified	1.5	1.6	....	2.5
Unknown	24.1	6.3	7.3	3.3

RAILWAY FIRE LOSSES
CALENDAR YEAR 1934

Within the Province of Alberta on those forested areas under the supervision of the Alberta Forest Service. This summary includes only those fires which started within 300 feet of the centre line of the railway right of way.

	Northern Alberta Railways Company	Canadian National Railways	Canadian Pacific Railway	Totals
Causes and numbers of fires:				
Locomotives	2	3	1	6
Railway employees	1	5	....	6
Campers and travellers	4	....	1	5
Settlers	....	....	....	....
Unclassified	....	1	....	1
Unknown	2	1	....	3
TOTALS	9	10	2	21
Number of acres burned:				
Slashing or old burn	....	....	....	....
Timber land	2	.....	.....	2
Young growth	20	322	1	343
Not forested	232	456¼	180	868¼
TOTALS	254	778¾	181	1,213¾
Loss:				
Timber	$12.00	.....	.....	$ 12.00
Young growth	25.00	$1,606.00	$2.50	1,633.50
Forest products	.....	11.50	.....	11.50
Other property	.....	50.00	.....	50.00
TOTALS	$37.00	$1,667.50	$2.50	$1,707.00

ANNUAL STATEMENT OF FIRE BY CAUSES, MONTHLY DISTRIBUTION, ETC., WITHIN FOREST RESERVES, ALBERTA—CALENDAR YEAR, 1934

Cause	Number						Damage	Area	Monthly Distribution												Prosecutions	Convictions	Fires Inside Provincial Forests		Fires Outside Provincial Forests	
	A	B	C	D	Tot.	P.C.			Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.			No.	Area	No.	Area
								Acres																Acres		Acres
Camp-fires	13	1	....	1	15	31.9	$83,427.50	18,570	....	....	....	....	....	1	2	4	2	1	4	1	1	1	15	18,570	....	.....
Smokers	8	....	1	2	11	23.4	6,862.00	1,942¼	....	....	....	1	2	....	3	4	1	....	....	....	....	....	11	1,942¼	....	.....
Settlers	....	....	....	....	....	....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	.....
Railways	....	1	....	....	1	2.1	20.00	4	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	4	....	.....
Lightning	9	....	2	1	12	25.5	4,986.37	1,440¼	....	....	....	....	8	....	....	4	....	....	....	....	....	....	12	1,440¼	....	.....
Industrial Operations	1	4	....	....	5	10.7	.....	6½	....	1	2	....	1	....	....	....	....	1	....	....	....	....	5	6½	....	.....
Incendiary	....	....	....	....	....	....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	.....
Public Works	....	....	....	....	....	....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	.....
Unclassified	3	....	....	....	3	6.4	900.00	.....	....	....	....	....	....	....	1	1	....	1	....	....	....	....	3	.....	....	.....
Unknown	....	....	....	....	....	....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	.....
TOTALS	34	6	3	4	47	100	$96,195.87	21,963	....	1	2	1	12	1	6	13	3	3	4	1	1	1	47	21,963	....	.....
Per cent.	72.3	12.8	6.4	8.5	100			.....	....	2.1	4.2	2.1	25.5	2.1	12.8	27.7	6.4	6.4	8.5	2.1						

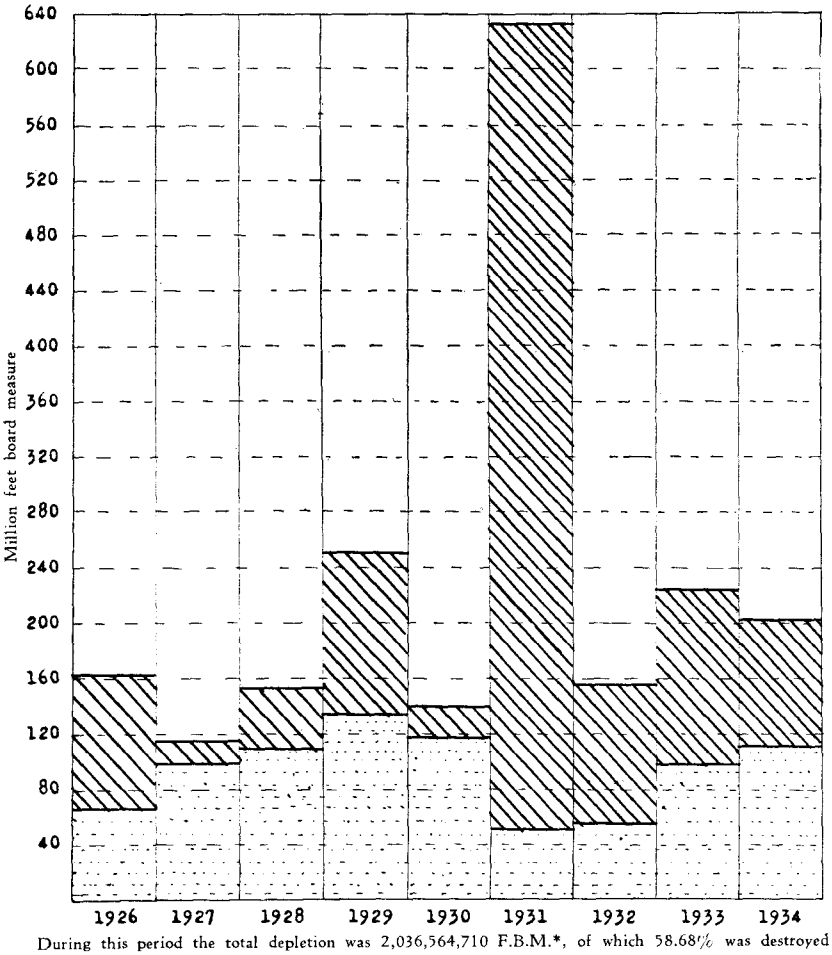
ANNUAL STATEMENT OF FIRES BY CAUSES, MONTHLY DISTRIBUTION, ETC., OUTSIDE FOREST RESERVES, ALBERTA—CALENDEAR YEAR, 1934

Cause	Number						Damage	Area	Monthly Distribution														Prose-cutions	Convic-tions	Fires Inside Provincial Forests		Fires Outside Provincial Forests	
	A	B	C	D	Tot.	P.C.			Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.			No.	Area	No.	Area
								Acres																		Acres		Acres
Camp-fires	43	4	18	5	70	36.3	$ 5,371.17	6,524	....	....	....	2	32	3	4	10	9	7	2	1	7	5	....	.....	70	6,254
Smokers	6	3	6	2	17	8.8	1,955.84	2,960	....	....	....	1	7	3	2	4	....	....	....	....	....	....	....	.....	17	2,960
Settlers	7	2	27	7	43	22.3	6,229.27	9,675	....	....	....	11	20	2	2	4	3	1	....	....	12	12	....	.....	43	9,675
Railways	4	2	4	1	11	5.7	1,556.00	1,096	....	....	....	2	5	1	....	1	....	2	....	....	....	....	....	.....	11	1,096
Lightning	4	1	1	....	6	3.1	34.50	14	....	....	....	....	....	1	5	....	....	....	....	....	....	....	....	.....	6	14
Industrial Operations ..	3	1	1	....	5	2.6	88.50	158	....	....	....	....	1	....	....	2	1	1	....	....	....	....	....	.....	5	158
Incendiary	4	4	12	7	27	14.0	13,642.74	14,585	....	....	....	5	21	1	....	....	....	....	....	....	....	....	....	.....	27	14,585
Public Works	1	1	1	....	3	1.5	16.50	15	....	....	....	....	2	....	....	1	....	....	....	....	....	....	....	.....	3	15
Unclassified	1	1	1	....	3	1.5	125.00	32	....	....	....	....	2	....	....	....	....	....	1	....	....	....	....	.....	3	32
Unknown	....	2	5	1	8	4.2	806.25	1,848	....	....	....	3	5	....	....	....	....	....	....	....	....	....	....	.....	8	1,848
TOTALS	73	21	76	23	193	100	$29,825.77	36,907	....	....	....	24	95	11	13	22	13	11	3	1	19	17	....	.....	193	36,907
Per cent.	37.8	10.9	39.4	11.9	100			.....	....	....	....	12.5	49.3	5.7	6.7	11.4	6.7	5.7	1.5	.5						

ANNUAL STATEMENT OF FIRES BY CAUSES, MONTHLY DISTRIBUTION, ETC., WITHIN AND OUTSIDE FOREST RESERVES, ALBERTA—CALENDAR YEAR 1934

Cause	Number						Damage	Area	Monthly Distribution												Prosecutions	Convictions	Fires Inside Provincial Forests		Fires Outside Provincial Forests	
	A	B	C	D	Tot.	P.C.			Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.			No.	Area	No.	Area
								Acres																Acres		Acres
Camp-fires	56	5	18	6	85	35.41	$ 88,798.67	25,094	....	....	....	2	32	4	6	14	11	8	6	2	8	6	15	18,570	70	6,524
Smokers	14	3	7	4	28	11.67	8,817.84	4,902¼	....	....	....	2	9	3	5	8	1	....	....	....	....	....	11	1,942¼	17	2,960
Settlers	7	2	27	7	43	17.92	6,229.27	9,675	....	....	....	11	20	2	2	4	3	1	....	....	12	12	....	.....	43	9,675
Railways	4	3	4	1	12	5.00	1,576.00	1,100	....	....	....	2	6	1	....	1	....	2	....	....	....	....	1	4	11	1,096
Lightning	13	1	3	1	18	7.50	5,020.87	1,454¼	....	....	....	....	8	1	5	4	....	....	....	....	....	....	12	1,440¼	6	14
Industrial Operations	4	5	1	....	10	4.17	88.50	164½	....	1	2	....	2	....	....	2	1	2	....	....	....	....	5	6½	5	158
Incendiary	4	4	12	7	27	11.25	13,642.74	14,585	....	....	....	5	21	1	....	....	....	....	....	....	....	....	....	.....	27	14,585
Public Works	1	1	1	....	3	1.25	16.50	15	....	....	....	....	2	....	....	1	....	....	....	....	....	....	....	.....	3	15
Unclassified	4	1	1	....	6	2.50	1,025.00	32	....	....	....	....	2	....	1	1	....	1	1	....	....	....	3	.....	3	32
Unknown	....	2	5	1	8	3.33	806.25	1,848	....	....	....	3	5	....	....	....	....	....	....	....	....	....	....	.....	8	1,848
TOTALS	107	27	79	27	240	100	$126,021.64	58,870	....	1	2	25	107	12	19	35	16	14	7	2	20	18	47	21,963	193	36,907
Per cent.	44.58	11.25	32.92	11.25	100			.....	....	.42	.83	10.42	44.58	5.00	7.92	14.58	6.67	5.83	2.92	.83	....	....	19.58	.....	80.42	.....

GRAPH OF TIMBER DEPLETION, PROVINCE OF ALBERTA
1926 TO 1934, INCLUSIVE



During this period the total depletion was 2,036,564,710 F.B.M.*, of which 58.68% was destroyed by fire and 41.32% utilized.

Legend

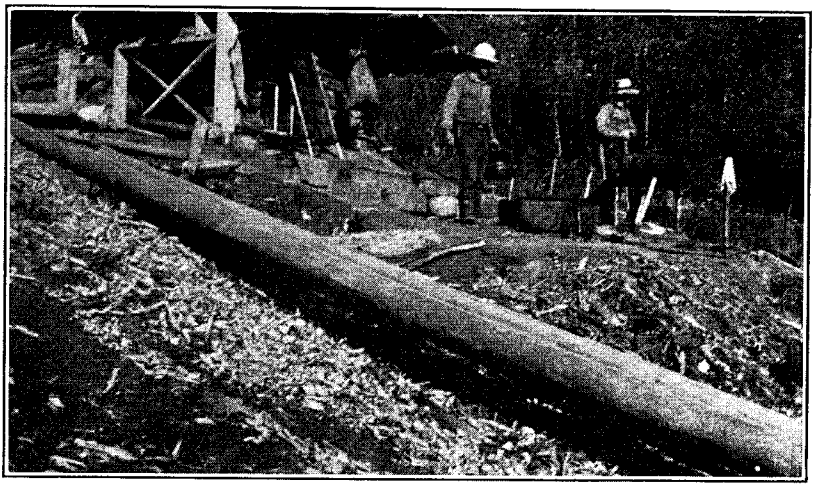
Timber destroyed by fire

Timber utilized

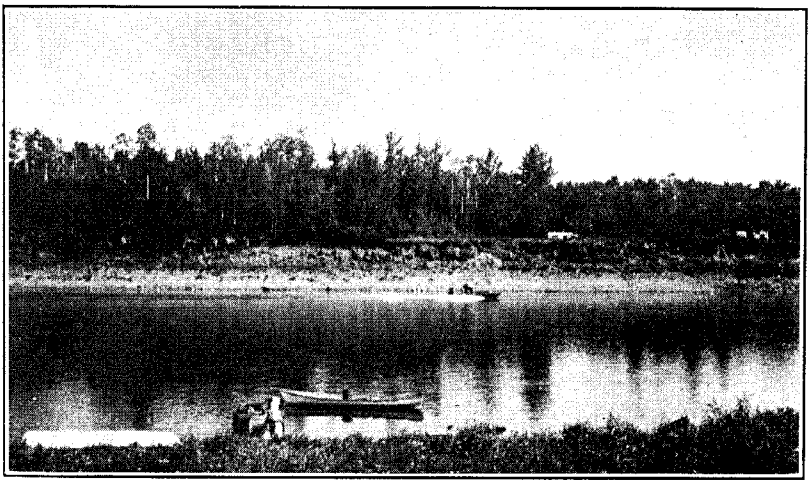
*F.B.M.—Feet board measure.

FIRE CAUSES	NUMBER OF FIRES					LANDS AFFECTED							LOSS										SUPPRESSION COSTS			
						Ownership		AREA	CONDITION				TIMBER (MERCHANTABLE AND CUT-OVER) SALVABLE			UNSALVABLE										
	A	B	C	D	Total	Public, Acres	Private, Acres	Total, Acres	Merchantable Timber, Acres	Cut-over Timber, Acres	Young Growth, Acres	Not Forested, Acres	Saw-timber, M.ft.B.M.†	Other, Cords	Depreciation	Saw-timber, M.ft.B.M.†	Other, Cords	Loss	Loss of Timber	Loss of Young Growth	Loss of Other Property	Total Loss	Ranger Service	Other Expenditure	Total	Burning Permits Issued
FIRES WITHIN FOREST RESERVES																										
Campers	13	1	....	1	15	18,570	.....	18,570	14,080	.....	3,850	640	10	200	$ 85.00	1,890	195,840	$75,330.00	$75,415.00	$ 8,012.50	.....	$ 83,427.50	$ 718.30	$12,390.78	$13,109.08	.....
Smokers	8	....	1	2	11	1,892¼	50	1,942¼	1,200¼	.....	722	20	1,500	9,000	.....	501	3,000	3,252.00	3,252.00	3,610.00	.....	6,862.00	430.94	14,987.88	15,418.82	.....
Railways	....	1	....	....	1	4	.....	4	.....	.....	4	.....	.....	.....	.....	.....	.....	.....	.....	20.00	.....	20.00	6.00	71.25	77.25	.....
Lightning	9	....	2	1	12	1,440¼	.....	1,440¼	1,280	.....	160	¼	.....	.....	.....	270	10,710	4,286.25	4,286.25	700.12	.....	4,986.37	353.94	2,148.92	2,502.86	.....
Industrial Operations	1	4	....	....	5	6½	.....	6½	.....	1¾	.....	4¾	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7.50	.....	7.50	.....
Unclassified	3	....	....	....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$ 900.00	900.00	.....	3.00	3.00	.....
TOTALS	34	6	3	4	47	21,913	50	21,963	16,560¼	1¾	4,736	665	1,510	9,200	$ 85.00	2,661	209,550	$82,868.25	$82,953.25	$12,342.62	$ 900.00	$ 96,195.87	$ 1,516.68	$29,601.83	$31,118.51	.....
FIRES OUTSIDE FOREST RESERVES																										
Campers	43	4	18	5	70	6,106	478	6,524	719½	700	1,359	3,745½	285	440	$ 657.50	228½	6,145	$ 3,150.32	$ 3,807.82	$,503.35	$ 60.00	$ 5,371.17	$ 670.02	$ 1,201.17	$ 1,871.19	.....
Smokers	6	3	6	2	17	1,773	1,187	2,960	555	210	143¼	2,051¾	485	1,250	1,140.00	27	220	216.87	1,356.87	598.37	.60	1,955.84	222.64	1,620.23	1,842.87	.....
Settlers	7	2	27	7	43	6,905	2,770	9,675	652¾	148¼	1,617	7,257	1,938	700	2,401.02	225	395	450.00	2,851.02	2,805.25	573.00	6,229.27	345.50	813.24	1,158.74	.....
Railways	4	2	4	1	11	730½	365½	1,096	.....	.....	310	786	.....	.....	.....	.....	.....	.....	.....	1,550.00	6.00	1,556.00	30.77	54.50	85.27	.....
Lightning	4	1	1	....	6	14	.....	14	4	.....	.....	10	.....	.....	.....	.....	46	34.50	34.50	.....	.....	34.50	45.27	8.25	53.52	.....
Industrial Operations	3	1	1	....	5	150	8	158	.....	100	8	50	.....	.....	.....	.....	.....	.....	.....	36.00	52.50	88.50	28.08	6.75	34.83	.....
Incendiary	4	4	12	7	27	14,126	459	14,585	678½	894	6,750	6,262½	595	320	855.00	50	7,443	4,087.74	4,942.74	8,700.00	.....	13,642.74	180.50	1,447.30	1,627.80	.....
Public Works	1	1	1	....	3	10	5	15	2	.....	10	3	1½	.....	2.50	.....	.....	.....	2.50	14.00	.....	16.50	.....	.....	.....	.....
Unclassified	1	1	1	....	3	30	2	32	.....	.....	.....	32	.....	.....	.....	.....	.....	.....	.....	.....	125.00	125.00	3.67	3.75	7.42	.....
Unknown	....	2	5	1	8	782	1,066	1,848	174	605¼	275	793¾	100	449	324.50	17	215	135.00	459.00	343.75	3.00	806.25	94.95	273.92	368.87	.....
TOTALS	73	21	76	23	193	30,626½	6,280½	36,907	2,785¾	2,657½	10,472¼	20,991½	3,404½	3,159	$ 5,380.52	547½	14,464	$ 8,074.43	$13,454.95	$19,550.72	$ 820.10	$ 29,825.77	$ 1,621.40	$ 5,429.11	$ 7,050.51	.....
FIRES WITHIN AND OUTSIDE FOREST RESERVES																										
Campers	56	5	18	6	85	24,676	418	25,094	14,799½	700	5,209	4,385½	295	640	$ 742.50	2,118½	201,985	$78,480.32	$79,222.82	$ 9,515.85	$ 60.00	$ 88,798.67	$ 1,388.32	$13,591.95	$14,980.27	.....
Smokers	14	3	7	4	28	3,665¼	1,237	4,902¼	1,755¼	210	865¼	2,071¾	1,985	10,250	1,140.00	528	3,220	3,468.87	4,608.87	4,208.37	.60	8,817.84	653.58	16,608.11	17,261.69	.....
Settlers	7	2	27	7	43	6,905	2,770	9,675	652¾	148¼	1,617	7,257	1,938	700	2,401.02	225	395	450.00	2,851.02	2,805.25	573.00	6,229.27	345.50	813.24	1,158.74	.....
Railways	4	3	4	1	12	734½	365½	1,100	.....	.....	314	786	.....	.....	.....	.....	.....	.....	.....	1,570.00	6.00	1,576.00	36.77	125.75	162.52	.....
Lightning	13	1	3	1	18	1,454¼	.....	1,454¼	1,284	.....	160	10¼	.....	.....	.....	270	10,756	4,320.75	4,320.75	700.12	.....	5,020.87	399.21	2,157.17	2,556.38	.....
Industrial Operations	4	5	1	....	10	156½	8	164½	.....	101¾	8	54¾	.....	.....	.....	.....	.....	.....	.....	36.00	52.50	88.50	35.58	6.75	42.33	.....
Incendiary	4	4	12	7	27	14,126	459	14,585	678½	894	6,750	6,262½	595	320	855.00	50	7,443	4,087.74	4,942.74	8,700.00	.....	13,642.74	180.50	1,447.30	1,627.80	.....
Public Works	1	1	1	....	3	10	5	15	2	.....	10	3	1½	.....	2.50	.....	.....	.....	2.50	14.00	.....	16.50	.....	.....	.....	.....
Unclassified	4	1	1	....	6	30	2	32	.....	.....	.....	32	.....	.....	.....	.....	.....	.....	.....	.....	1,025.00	1,025.00	3.67	6.75	10.42	.....
Unknown	....	2	5	1	8	782	1,066	1,848	174	605¼	275	793¾	100	449	324.50	17	215	135.00	459.50	343.75	3.00	806.25	94.95	273.92	368.87	.....
TOTALS	107	27	79	27	240	52,539½	6,330½	58,870	19,346	2,659¼	15,208¼	21,656½	4,914½	12,359	$ 5,465.52	3,208½	224,014	$90,942.68	$96,408.20	$27,893.34	$ 1,720.10	$126,021.64	$ 3,138.08	$35,030.94	$38,169.02	.....
SUMMARY BY DIVISIONS																										
DIVISIONS																										
Cypress Hills	1	....	....	1	2	1,350	50	1,400	1,200	.....	200	.....	1,500	9,000	.....	500	3,000	$ 3,250.00	$ 3,250.00	$ 1,000.00	.....	$ 4,250.00	$ 203.63	$12,406.03	$12,609.66	.....
Crowsnest	3	1	....	3	7	19,392	326	19,718	14,088	.....	4,404	1,226	10	200	85.00	1,914	195,840	75,378.00	75,463.00	10,817.50	.....	86,280.50	808.10	15,376.51	16,184.61	.....
Bow River	12	3	3	....	18	205	.....	205	¾	.....	175	29¼	.....	.....	.....	2	.....	2.87	2.87	775.12	.....	777.99	239.26	1,543.06	1,782.32	.....
Clearwater	16	2	7	3	28	4,052½	1,200	5,252½	1,455¼	350¼	620¼	2,826¾	120	.....	240.00	272	10,930	4,454.25	4,694.25	1,708.00	$ 900.00	7,302.25	479.58	1,908.35	2,387.93	428
Brazeau	6	5	....	....	11	17½	.....	17½	.....	1¾	14	1¾	.....	.....	.....	.....	.....	.....	.....	32.50	.....	32.50	68.25	258.10	326.35	1
Athabasca	3	....	....	....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.56	.....	5.56	8
*N.A.F.D.	66	16	69	20	171	27,552½	4,754½	32,277	2,602	2,307¼	9,795	17,572¾	3,284½	3,159	5,140.52	520½	14,244	7,857.56	12,998.08	13,560.22	820.10	27,378.40	1,333.70	3,538.89	4,872.59	1,385
TOTALS	107	27	79	27	240	52,539½	6,330½	58,870	19,346	2,659¼	15,208¼	21,656½	4,914½	12,359	$ 5,465.52	3,208½	224,014	$90,942.68	$96,408.20	$27,893.34	$ 1,720.10	$126,021.64	$ 3,138.08	$35,030.94	$38,169.02	1,822

†M.ft. B.M.—Thousand feet, board measure.
*N.A.F.D.—Northern Alberta Forest District.



Trappers' cabin at mouth of Little Buffalo River on the Athabasca. Natural gas seepages furnish light and heat used in cabin



The Snye at Fort McMurray in front of Forestry headquarters

Personnel.—Field staff strength remains at the same figure as previously reported. This matter has been referred to in previous reports and it has been indicated that the situation in this respect is not satisfactory. Staff numbers and periods of employment do not meet the requirements of forest administration and forest protection. The great reduction made in the permanent staff together with the short period of employment of seasonal members has resulted in a difficult situation in respect to the maintenance of roads, trails and telephone lines and the repair of equipment prior to the opening of the fire season. In addition it is not possible to deal properly with the hazard arising from spring burning and winter ground fires unless the seasonal staff be employed considerably before the commencement of the fire season.

The settlement of marginal lands, sub-marginal lands and lands within timber areas and totally unsuited for agriculture has provided a grave menace to mature timber and to the young growth upon which the timber industry of

the province will depend in the future for raw material. This particular feature places an additional burden on the field staff and one with which under present strength it cannot cope in a season of hazardous weather.

The importance of forest cover is so evident that there is scarcely any necessity of referring to it here. It is also realized that during recent years it has been necessary to operate or provide services with the strictest economy, but it is only necessary to point out that mature timber destroyed by fire cannot be replaced in a normal lifetime and that the destruction of young growth is often followed by a generation of weed trees or in many cases by complete barren. Economy may easily defeat its own ends.

Fire Fighting Equipment.—During recent years it has been impossible to keep the supply of special fire fighting equipment at a safe level. At the outset the Forest Service was handicapped by a serious shortage of equipment throughout the forested territory of northern and central Alberta. It has not been possible to correct this situation nor has it been possible to provide for the replacement of equipment now in use but obsolete.

Co-operation.—The extent of voluntary co-operation from many sources indicates the interest of the general public in matters of fire prevention and forest protection. Most of this help originates from persons who can expect no return for their assistance other than the good of the province.

Pre-arranged co-operation on the basis of mutual benefits is in many respects on a satisfactory footing, but it is apparent that a more definite understanding is necessary in some directions. In particular this is necessary with the Province of British Columbia, an instance being the Castle River fire which originated in that province and spread unchecked into Alberta.

In general the co-operation received, whether voluntary or pre-arranged, is appreciated and the valuable assistance given in the vital matter of forest protection is hereby acknowledged.

Forest Administration

Provincial Forest Reserves.—The disposal of timber by timber sale and timber permit continued on the same basis as in preceding years, and a slight drop in both sale and permit revenue is noted. There was particularly a decrease in timber permit business in the Crowsnest-Bow River forest and an increase in the Cypress Hills Forest Reserve. In the latter instance there has been a good demand for timber which was fire-killed in the Willow Creek fire of last year and it appears that this material will be largely salvaged.

During the period under review there were 19 active and 7 inactive timber sales on forest reserves. Four sales on which operations had been completed were closed out. Five new sales were awarded from which it is estimated that the following timber may be utilized:

3,680,000 F.B.M.* of green saw-timber,
270,000 F.B.M.* of dry saw-timber,
10,000 railway ties,
50,000 lineal feet of green mine props.

TIMBER CUT ON TIMBER SALES
ALBERTA FOREST RESERVES
April 1st, 1934 to March 31st, 1935

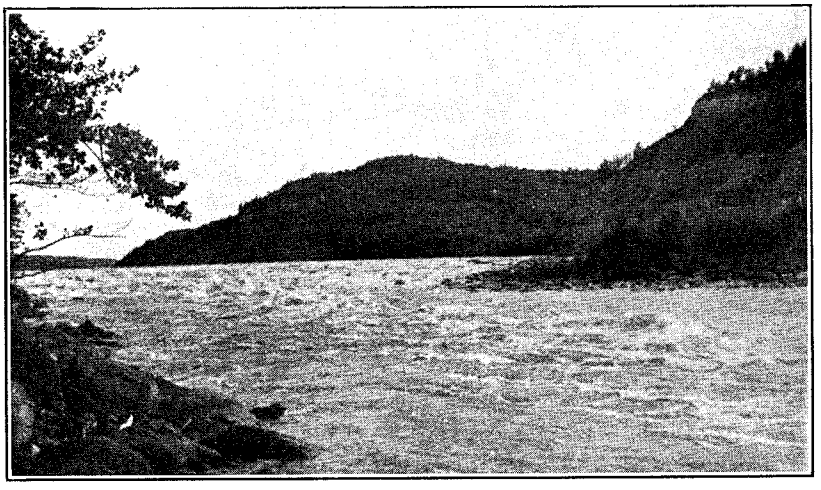
	Crowsnest	Bow River	Clearwater	Brazeau	Totals
Lumber (F.B.M.*)	1,212,884	1,074,981	.....	937,582	3,225,447
Railway ties	653	.....	.....	50,737	51,390
Mine ties (lineal feet)	22,240	.....	.....	2,584	24,824
Mine props (lineal feet)	1,032,272	.....	566,316	292,904	1,891,492
Mine timber (lineal feet)	.....	.....	18,048	.....	18,048
Lagging (lineal feet)	132,126	.....	61,312	.....	193,438
Slab (cords)	.....	.....	.....	114	114
Value	$4,902.60	$2,459.20	$2,675.51	$7,024.63	$17,061.94

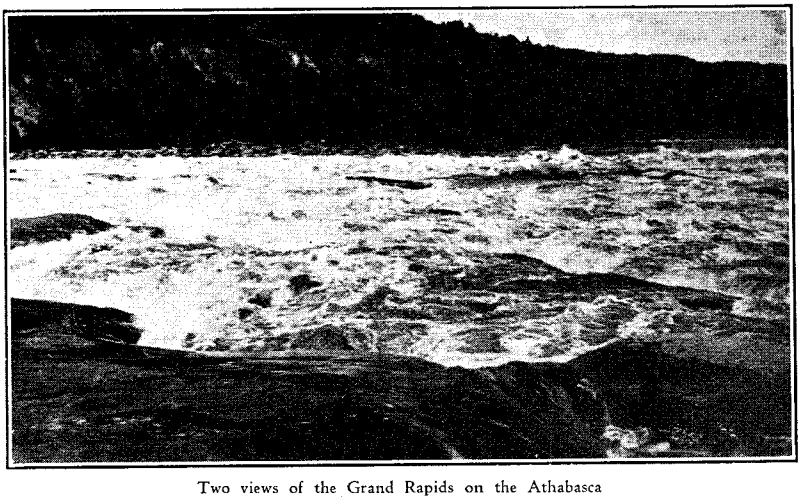
*F.B.M.—Feet, board measure.

TIMBER CUT UNDER PERMIT, ALBERTA FOREST RESERVES, FISCAL YEAR, 1934-35

Forest	No. of Permits	Dry Fuel Wood (cords)	Green Fuel Wood (cords)	Mine Timber Dry *lin. ft.	Mine Timber Dry *lin. ft.	Fence Posts	Sawlogs †F.B.M.	Round Timber ‡pcs.	Round Timber *lin. ft.	Lagging *lin. ft.	Telephone Poles	Christmas Trees
Cooking Lake	9	.....	.....	.....	.....	3,600	.....	25	200	.....	.....	.....
Cypress Hills	430	388	.....	.....	.....	25,934	2,000	35,614	1,200	.....	.....	.....
Crowsnest-Bow River	492	4,376	192	986,752	3,402	6,267	990,149	24,501	39,975	315,090	.....	50
Clearwater	22	40	.....	10,000	2,000	1,125	.....	1,198	900	.....	.....	.....
Brazeau-Athabasca	40	297	.....	12,068	.....	.....	.....	429	7,274	.....	5	.....
TOTALS	993	5,101	192	1,008,820	5,402	36,926	992,149	61,767	49,549	315,090	5	50

*Lin. Ft.—Lineal Feet.
†F.B.M.—Feet, board measure.
‡Pcs.—Pieces.





Two views of the Grand Rapids on the Athabasca

GRAZING

Reviewing the grazing use it will be noted that there was an increase in cattle of 2,327 head and a decrease in horses and sheep of 644 and 3,627 respectively. During the year a complete utilization of cattle and horse range was effected in the Cypress Hills Forest Reserve and in the Rocky Mountain Forest Reserve as far north as the Elbow River, a condition which has been unusual in a number of years. It is well known that many stockmen have, due to market conditions, withheld stock which normally would be sold and that as a consequence the herds are above normal numbers. This fact together with the shortage of range forage due to continuous drought is reflected in the cattle total for the year and the full utilization of cattle and horse range as previously noted. Drought on the southern ranges is causing grave concern. The foothill and mountain ranges within the forest reserves show for almost the first time the continued effects of sub-normal precipitation and a close utilization with the result that a reduction in carrying capacity is necessary on a number of grazing

divisions. Should these conditions continue the stockmen, through force of circumstances, will have to reduce their herds. It will be regrettable if such curtailment becomes necessary for the stockmen might suffer a great financial loss, but there appears to be a strong probability that saleable cattle may be marketed at a profit due to general unsatisfactory conditions obtaining in the stock industry in the United States. If this probability becomes an established fact the herds of southern Alberta will be reduced for the most part in a normal way.

Stock was removed from forest range at the end of the summer grazing season in reasonably good condition. In a few instances new stock found the foothill and mountain range strange and did not show the improvement desired. This feature is usual with cattle from the plains, and the fact that it occurred last season should not be used as a yard-stick to measure general grazing results.

Every effort is being made to maintain the forest range in good condition and with this aim in view it follows that drought and close utilization will force a reduction in authorized carrying capacity which in turn will make necessary a reduction of grazing privileges to the individual permittee. It will be realized, however, that such steps are in the interest of all concerned and will be taken only when the necessity is evident.

During the year there was a further increase in the use of range in the Clearwater River valley. The farmers and ranchers in the vicinity of the Clearwater forest have secured very satisfactory results in grazing livestock within that reserve, and with the help of the Forest Superintendent have organized for community grazing. It would appear that an increase in the use of this range may be looked for.

The grazing trespass situation in the Clearwater forest received attention and reasonably satisfactory results were obtained in a round up of trespassing horses. The situation cannot be dealt with finally and definitely until the question of occupation of forest reserve lands by Stony Indians is settled.

GRAZING STATEMENT—ALBERTA FOREST SERVICE, 1934

Forest	No. of Permits	No. of Horses	No. of Cattle	No. of Sheep
Cypress Hills	65	228	2,823	.....
Crowsnest	194	1,060	11,546	2,778
Bow River	72	522	7,913	300
Clearwater	75	224	194	.....
Brazeau	103	272	81	.....
Athabasca	8	235	.....	.....
TOTALS	5517	2,541	22,557	3,078

COMPARATIVE STATEMENT, GRAZING—ALBERTA FOREST SERVICE

Grazing year	1931	1932	1933	1934	Totals	Average
Number of Permits	456	606	493	517	2,072	518
Number of cattle	15,041	20,086	20,230	22,557	77,914	19,478
Number of horses	3,417	3,377	3,185	2,541	12,520	3,130
Number of sheep	4,379	7,465	6,705	3,078	21,627	5,407

IMPROVEMENTS

The maintenance of the various classes of improvements which have been constructed with a view to aiding in matters of protection and administration has been dealt with only by the regular field staff. The year was a favourable one for such work excepting in the southern part of the province where due to the long and acutely dangerous fire period it became necessary for the field staff in this region to concentrate on fire prevention and suppression.

Under prevailing conditions of employment of the field staff the telephone lines, trails and roads are not maintained for a period of at least five months in

each year, and of course there can be no preparation for spring and summer manitenance work. As a consequence the work is much heavier due to the accumulation of damage. Such a situation does not favour forest protection. Very little new construction work was undertaken and only important projects were commenced. An instance is the gap in the telephone system between the Crowsnest and Bow River divisions. It is expected that that connection will be made early in the summer of 1935. A similar situation exists in respect to the Brazeau and Athabasca divisions, and it is very important from the view-point of protection and administration that steps be taken to remedy this at an early date. At the present time the Brazeau division does not secure full benefit of the lookout station north of Entrance and direct action on matters of protection, supervision and administration by the supervisor from forest headquarters is not now possible. In the southern portion of the Rocky Mountain Forest Reserve the improvement of public camp grounds was continued and six camp stoves were erected. It is hoped to make further progress on this important work to the end that camping may be enjoyed by the public with a maximum of safety to the forest.

Relief camps as in former years were employed within the Rocky Mountain Forest Reserve. Construction work was continued on the road up the Saskatchewan valley west of Nordegg, and the progress has been quite satisfactory considering the circumstances under which the work is carried on.

In the Crowsnest-Bow River forest a bridge was completed across Racehorse Creek, a tributary to the Old Man River. The road through the Gap in the Old Man Valley was relocated in some dangerous sections, a new grade established and the old sections of the road improved.

The operation of these camps is the responsibility of the Relief Commission so that the Forest Service is concerned only in locating the work to be done and in matters of general co-operation with the Commission.

STATEMENT OF REVENUE—FOREST RESERVES, 1934-35

Surface rentals	$ 2,376.19
Miscellaneous use permits	896.83
Timber permits	9,935.68
Timber sales guarantee deposits	1,770.00
Timber sale dues	13,890.82
Grazing permits	14,838.72
Hay permits	279.80
Fishing permits	1,066.50
Sundry revenue	952.60
Miscellaneous (services and supplies)	490.54
TOTAL	$46,497.68

IMPROVEMENT STATEMENT

NEW CONSTRUCTION PROJECTS:

Forest	Houses	Cabins	Stables	Sheds, Garages, etc.	Trails (Miles)	Fields (Acres)	Fences	Bridges	Corrals	Telephone Lines (Miles)	Water Supplies	Signs	Camp Grounds
Cypress Hills	....	....	....	....	....	....	....	....	....	....	1	....	....
Crowsnest	....	....	3	1	3	....	....	....	....	12	....	....	....
Bow River	1	1	....	3	25	....	2	....	1	....	....	....	6
Clearwater	1	....	....	....	....	....	....	....	....	....	....	....	....
Brazeau	....	....	....	....	10	....	3	....	....	....	1	....	....
Athabasca	....	....	....	2	9	13	2	1	1	....	....	1	....
TOTALS	2	1	3	6	47	13	7	1	2	12	2	1	6

MAINTENANCE PROJECTS:

Forest	Houses	Cabins	Stables	Sheds, Garages, etc.	Trails (Miles)	Roads (Miles)	Telephone Lines (Miles)	Fences	Hay Meadows and Fields	Bridges
Cypress Hills	1	....	....	3	....	....	12	2	....	....
Crowsnest	8	6	5	12	349½	126½	152½	21	1	2
Bow River	4	9	5	2	710	70½	250½	23	3	....
Clearwater	3	6	2	6	808	2	175	5	....	....
Brazeau	6	8	2	3	306	....	117	9	....	1
Athabasca	1	13	1	1	422½	36	64	7	....	....
TOTALS	23	42	15	27	2,596	235	771	67	4	3

MAINTENANCE PROJECTS—*Continued*:

IMPROVEMENT STATEMENT

Forest	Corrals	Grounds	Water Supply	Signs	Lookout Towers	Fire-guard Roads (Miles)	Ferries	Root Cellars	Gateways	Camp Grounds
Cypress Hills	....	1	....	1	....	30	....	....	....	....
Crowsnest	2	6	1	4	....	....	....	1	....	1
Bow River	6	9	5	4	....	....	....	....	2	....
Clearwater	2	....	1	....	....	....	1	....	....	....
Brazeau	1	5	1	....	1	....	....	....	....	....
Athabasca	3	1	1	....	....	....	....	....	....	....
TOTALS	14	22	9	9	1	30	1	1	2	1

NEW CONSTRUCTION PROJECTS:

IMPROVEMENTS—STATEMENT OF MAN-DAYS W ORKED

Forest	Houses	Cabins	Stables	Sheds, Garages, etc.	Trails	Fields	Fences	Bridges	Corrals	Telephone Lines	Water Supplies	Signs	Camp Grounds
Cypress Hills	....	....	....	....	....	....	....	....	....	....	8	....	....
Crowsnest	....	....	17½	26½	2	....	....	....	....	53	....	....	....
Bow River	6	12½	....	55	35	....	1	....	2	....	....	....	43½
Clearwater	4	....	....	....	....	....	....	....	....	....	....	....	....
Brazeau	....	....	....	....	1	....	36½	....	....	....	76½	1	....
Athabasca	....	....	....	29	2	159½	19	1	13	....	....	....	....
TOTALS	10	12½	17½	110½	40	159½	56½	1	15	53	84½	1	43½

MAINTENANCE PROJECTS: IMPROVEMENTS—STATEMENT OF MAN-DAYS WORKED

Forest	Houses	Cabins	Stables	Sheds, Garages, Etc.	Trails	Roads	Telephone Lines	Fences	Hay Meadows and Fields	Bridges
Cypress Hills	1	....	....	15½	....	....	13½	3	....	....
Crowsnest	50	16	10½	22½	205½	123½	167½	86½	2	4
Bow River	8	22	6½	6½	384	176½	414	135	16	....
Clearwater	44	18	....	1	498	28	109	82	....	....
Brazeau	27	27½	1½	16½	221	....	108	74	....	2½
Athabasca	2½	49½	1	....	157½	66	55	47	....	....
TOTALS	132½	133	19½	62	1,466	394	867	427½	18	6½

Forest	Corrals	Grounds	Water Supplies	Signs	Lookout Towers	Fire-guard Roads	Ferries	Root Cellars	Gateways	Camp Grounds
Cypress Hills	....	11	....	½	....	5	....	....	....	....
Crowsnest	6	31½	½	35½	....	....	....	½	....	13½
Bow River	28½	27½	12½	3½	....	....	....	....	4	....
Clearwater	8	....	1	....	....	....	8	....	....	....
Brazeau	6	39½	½	....	4½	....	....	....	....	....
Athabasca	5½	7½	2	....	....	....	....	....	....	....
TOTALS	54	117	16½	39½	4½	5	8	½	4	13½

Administration of Forest Disposal

The administration of the timber resources on all provincial Crown lands not included in the forest reserves was continued in the same manner as in preceding years.

For the first time in several years an appreciable general increase was noted both in the number of operations and in the total production of the majority of timber products. This increase, though not great, is regarded as a good omen, particularly in view of the fact that no general improvement is yet noticeable in the building and timber-using industries.

Although the total increase of production over the previous year is a moderate one, the increase in gross timber revenue is quite substantial. This is principally due to the fact that the very large increase in production of railway ties in the preceding year was well maintained and also to the fact that much of the revenue on account of the previous year's increased tie operations was received by the Department during the current year. Gross receipts of timber revenues from all sources during the fiscal year 1934-35 show an increase of approximately 46% over the preceding year, in spite of the fact that certain reductions were made in the rates of dues payable.

Some of the manufacturers having stocks of dry well milled spruce on hand found a considerable outlet for this material in Ontario and in the middle Western States. It would appear that market conditions were slightly improved both in regard to demand and prices.

The timber regulations were amended in May, 1934, effecting certain reductions of dues payable on timber cut under permit on timber permit berths, these reductions in most cases applying to poplar. In December 1934, certain orders in council reduced the dues payable on sawn lumber manufactured from timber cut between October 1st, 1934 and September, 1935 from timber berths in the province. These reductions were made in recognition of the unfavourable economic conditions facing the operators of sawmills, and also with the object of encouraging the industry to employ a number of workers who would otherwise be on relief. The reductions authorized were 25c per thousand feet, board measure, on sawn lumber from licensed timber berths, 50c per thousand feet, board measure, on sawn lumber from permit berths, and a 10% reduction of dues payable on sawn lumber from damaged timber berths, in each case applicable only to dues on material manufactured from timber cut between dates specified.

The amendment to the timber regulations made effective in December, 1933 authorizing the issue of special permits to cut timber from isolated tracts not exceeding 160 acres in area and containing not more than 125,000 feet, board measure, proved of great value to the smaller operators by enabling them to utilize these small blocks of timber without the expense of purchasing a timber berth. The popularity of this class of special timber permit was evidenced by the fact no less than 252 such permits were issued during the year 1934-35, in addition to 61 granted from December, 1933 to March 31st 1934.

The agreement by which permits to cut railroad ties were issued to the Supervisor of Charity and Relief on behalf of individuals who would otherwise be on relief was continued and has worked out satisfactorily. The permit fee is prepaid by the Relief Branch, and dues are collected from the railroad company upon acceptance of the ties.

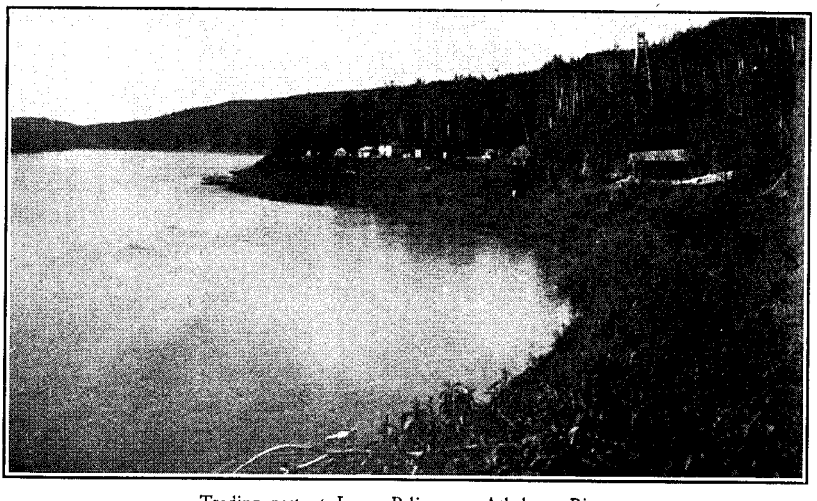
The disposal of slash by lopping and scattering is being strictly enforced, and recent operations will not result in the extreme fire traps that were all too prevalent in older operations.

There is a noticeable tendency towards closer utilization in manufacture on the part of some of the larger operators. Utilization in logging practice is

satisfactory in respect to timber felled and possibly too close in respect to the lower diameter classes where the land on which the operation occurs is absolute forest land.

The inspection ond supervision work required of the timber inspectors was heavier even than in the preceding year. A very considerable amount of inspection work originates through complaints presented and through the illegal taking of timber which necessitates investigation. Existing conditions have a bearing on this phase of inspection work. No less than 2,284 inspection reports were submitted during the year under review, an increase of 16% over 1933-34 and this with no increase in personnel, and with the arrangement still in force under which timber inspectors act as sub-agents of provincial lands on certain days each month at one or more points in their districts. As previously stated these sub-agency duties together with the increased demands for timber inspectors and supervision, impose a burden which in some districts is already reducing the present high efficiency of the inspection work.

Camp of Chisholm Lumber Company on Athabasca River below Fort Assiniboine



Trading post at Lower Pelican on Athabasca River.
Natural gas from well supplies light, heat and power for machine shop.

STATEMENT OF TIMBER OPERATIONS ON PROVINCIAL AND SCHOOL LANDS

April 1st, 1934 to March 31, 1935

	Licensed Timber Berths	Permit Timber Berths	School Lands Timber Berths	Provincial Lands Timber Permits	School Lands Timber Permits	Totals
Number of active operations	37	138	15	3,268	292	3,750
Lumber, (F.B.M.)*	26,427,718	14,729,716	935,087	16,771,232	715,134	59,578,887
Railway ties	157,278	560,693	36,757	294,116	12,150	1,060,994
Piling (lineal feet)	1,250	3,108	.....	18,036	.....	22,394
Mining Timber (lineal feet)	6,918	5,140	.....	520,704	56,000	588,762
Lath	5,071,960	990,500	.....	.....	.....	6,062,460
Telegraph and Telephone Poles	.....	.....	.....	29,383	.....	29,383
Building Logs (lineal feet)	.....	256	.....	360,085	3,494	363,835
Fence Rails	.....	.....	.....	1,284,554	1,650	1,286,204
Roof Poles	.....	.....	.....	283,045	150	283,195
Fence Posts	.....	200	.....	358,144	5,060	363,404
Shingles	350,000	924,500	.....	344,300	.....	1,618,800
Shingle bolts (cords)	.....	13	.....	129	15½	157½
Cordwood (cords)	443	2,018	18	4,966	1,167	8,612

Number of Inspection Reports submitted by Timber Inspectors		2,284
Number of Timber Seizures made on Provincial Lands	179	
Number of Timber Seizures made of School Lands	17	
	196	

*F.B.M.—Feet, board measure.

SUMMARY OF SUB-AGENCY DUTIES PERFORMED BY TIMBER INSPECTORS

April 1, 1934 to March 31, 1935

Inspection Districts	Sub-Agency	Entries		Reservation for Minors	Improvements	Statutory Declarations	Abandonments	Applications for					Miscellaneous	Total Transactions	Revenue Collected
		Homestead	Soldier Grant					Cancel-ations	Grazing Leases and Permits	Hay Permits	Timber Permits	Patent			
Edmonton	Breton	7	1	....	1	....	4	12	....	....	12	6	3	46	$ 137.25
Edson	Edson	39	1	....	3	....	1	10	1	4	5	8	7	79	527.63
Athabasca	Athabasca	104	1	....	10	....	7	50	2	2	35	22	16	249	1,608.56
	Barrhead														
Bonnyville	Bonnyville	138	....	....	18	24	6	89	15	6	43	21	24	384	2,249.11
McMurray	McMurray	1	....	....	....	....	....	....	....	....	2	....	....	3	45.00
Slave Lake	Slave Lake	19	1	....	....	....	2	10	....	23	....	....	2	57	455.50
Grande Prairie	Debolt	68	1	5	17	63	18	43	4	7	52	79	22	379	1,668.03
	Spirit River														
Peace River	Fairview	86	....	2	14	57	34	53	39	6	77	161	62	591	2,156.88
	Hines Creek														
	McLennan														
TOTALS		462	5	7	63	144	72	267	61	48	226	297	136	1,788	$8,847.96

Nursery and Tree Distribution

Nursery.—The tree nursery operations of the Forest Service at the mental institutes at Oliver and Ponoka, and the jails at Fort Saskatchewan and Lethbridge were continued on a larger scale than in preceding years. The principal nursery is at Oliver, whence all transplants are shipped and seedlings are provided for the subordinate nurseries; there, under direction, patients from the mental institutes provide the labour.

Following is a statement of the amount of planting in seed-beds at Oliver in the spring of 1935; these seed-beds are four feet wide, and the amount of seeding is shown in lineal feet:—

435 lineal ft. White spruce (*Picea glauca*).
50 " " Norway spruce (*Picea excelsa*).
81 " " White elm (*Ulmus americana*).
9 " " European common spruce (*Picea tianschanica*).
12 " " Scotch pine (*Pinus sylvestris*).
7 " " Ladoga pine (*Bugnet—Pinus sylvestris*).
4 " " Limber pine (*Pinus flexilus*).
9 " " Douglas fir (*Pseudotsuga mucronata*).
10 " " Red pine (*Pinus resinosa*).
5 " " Pinon pine (*Pinus edulus*).
21 " " Colorado blue spruce (*Picea pungens*).

The following one-year-old seedlings are in the seed-beds:—

120,000 White spruce (*Picea glauca*).
10,400 Lodgepole pine (*Pinus murrayana*).
5,000 Douglas fir (*Pseudotsuga mucronata*).
2,000 Siberian larch (*Larix sibirica*).
400 Scotch pine (*Pinus sylvestris*).
30 Ladoga pine (*Bugnet—Pinus sylvestris*).
20 White pine (*Pinus strobus*).
2,000 Red pine (*Pinus resinosa*).

The following two-year-old seedlings are in the seed-beds:

30,700 White spruce (*Picea glauca*).
8,900 Nordman fir.
1,900 Red pine (*Pinus resinosa*).
275 Douglas fir (*Pseudotsuga mucronata*).
40 Limber pine (*Pinus flexilus*).
2,100 Lodgepole pine (*Pinus murrayana*).

In the spring of 1935 seeds of the following exotics were planted in small quantities:

Butternut (*Juglans cinerea*).
Shagbark hickory (*Carya ovata*).
Black walnut (*Juglans nigra*).
White oak (*Quercus alba*).
Bur oak (*Quercus macrocarpa*).
Mountain ash (*Pyrus americana*).

Seeds and seedlings of the following exotics which were planted in previous years and which are doing well are:—

Silver maple (*Acer saccharinum*).
Austrian pine (*Pinus nigra*).
Japanese walnut (*Juglans cordiformis*).
Cedar (*Thuja occidentalis*).
Filberts.
Black walnut (*Juglans nigra*).
Yellow birch (*Betula lutea*).
Catalpa.
Black locust (*Robinia pseudacacia*).
Cereocarpus (*Purvifolious*).
Horse chestnut (*Aesculus hippocastanum*).
Manchurian maple.
Russian olive (*Elaeagnus angustifolia*).
Honey locust (*Gleditsia*).
Beech (*Fagus grandifolia*).
Blackfoot poplar (From Mr. Griffin of Brooks, Alberta).
Sugar maple (*Acer saccharum*).
English walnut (*Juglans regia*).
Red oak (*Quercus rubra*).
Black willow (*Salix nigra*).
Peach-leaved willow (*Salix amygdaloides*).

From seeds planted in the fall of 1934 it is estimated that the following number of seedlings are thriving:—

200 Beech (*Fagus grandifolia*).
8,400 White ash (*Fraxinus americana*).
4,400 Red oak (*Quercus rubra*).
21,000 Bur oak (*Quercus macrocarpa*).

Seedlings were taken from Oliver for the transplant beds at outside points in the following quantities:

For Fort Saskatchewan Jail:—
3,000 Lodgepole pine (*Pinus murrayana*).
38,000 Scotch pine (*Pinus sylvestris*).
For Ponoka Mental Institute:—
93,000 Scotch pine (*Pinus sylvestris*).
For Lethbridge Jail:—
28,000 Scotch pine (*Pinus sylvestris*).

These seedlings were set out in transplant beds prepared at the locations as shown. The work was done at the jails by inmates under the direction of guards, and at Ponoka under the supervision of a man sent by the Service to direct the work. The principal transplant beds are, however, established at Oliver and species will be available for distribution from this centre as follows:—

In 1936:—
18,000 Green ash (*Fraxinus pennsylvanica*).
330 Mountain ash (*Pyrus americana*).
400 Bur oak (*Quercus macrocarpa*).
7,000 Scotch pine (*Pinus sylvestris*).
1,400 White elm (*Ulmus americana*).
5,100 Jack pine (*Pinus banksiana*).
27,350 White spruce (*Picea glauca*).
107,275 Lodgepole pine (*Pinus murrayana*).
In 1937:—
2,600 Mountain ash (*Pyrus americana*).
18,400 Scotch pine (*Pinus sylvestris*).
1,250 Ladoga pine (from *Bugnet—Pinus sylvestris*).
350 Yellow pine (*Pinus ponderosa*).
3,240 Red pine (*Pinus resinosa*).
1,650 Lodgepole pine (*Pinus murrayana*).
13,000 Colorado blue spruce (*Picea pungens*).
24,250 White elm (*Ulmus americana*).
1,900 Red oak (*Quercus rubra*).
6,400 Green ash (*Fraxinus pennsylvanica*).

Tree Distribution.—The shipping of trees from Oliver started on May 2nd and ended May 21st, 1935. The spring was late and cold, and snow was lying on the ground when the work began at Oliver.

For the first few days of shipping, the weather was not favourable for the planting of trees in the central and northern parts of the province. The first shipments were therefore sent to southern Alberta, and those for the central and northern areas were sent out later.

Following is a list of the transplants, seedlings, and cuttings shipped from Oliver in the spring of 1935:—

Transplants: 57,348 White spruce (*Picea glauca*).
5,097 Green ash (*Fraxinus pennsylvanica*).
1,446 White elm (*Ulmus americana*).
1,254 Russian poplar (*Populus balsamifera*).
578 Bur oak (*Quercus macrocarpa*).
302 Siberian larch (*Larix sibirica*).
40 Lodgepole pine (*Pinus murrayana*).
370 Colorado blue spruce (*Picea pungens*).
83 Mountain ash (*Pyrus americana*).
745 Scotch pine (*Pinus sylvestris*).
16 Red oak (*Quercus rubra*).
3,300 Laurel leaf willow (*Salix pentandra*).
Sub-total:—70,579.
Seedlings: 1,500 White elm (*Ulmus americana*).
1,500 Scotch pine (*Pinus sylvestris*).
300 Bur oak (*Quercus macrocarpa*).
Sub-total:—3,500.
Cuttings: 6,300 Russian poplar (*Populus balsamifera*).
1,800 Willow (*Salix discolor*).
19,000 Golden willow (*Salix vitellina*).
Sub-total:—27,100.
TOTAL:—101,179.

Of the species listed, those other than White Spruce, Green Ash, Elm, and Russian Poplar were for the most part allotted to institutions.

In addition to these a limited quantity of exotics, useful principally for beautification, were given to the Department of Public Works at Edmonton, the Experimental Farm at Lacombe, the Technical School at Calgary and the University of Alberta.

A total of 300 applications were approved of which 43 were for institutions, 23 for schools and 234 for private individuals. Trees were sent to 136 different express offices.

Before shipping came to an end it was found that it would not be possible to give Green Ash trees to all the applicants to whom they had been promised, as there was a demand for planting them on certain publicly owned lands which had not been foreseen when the approvals were made up. Those who were expecting Green Ash trees which could not be sent were advised of the situation and invited to apply for more trees for 1936.

In addition to the stock given to the various organizations and individuals already mentioned, the following seedlings were also despatched:—

To the Park Superintendent, City of Calgary:—
25,000 White elm (*Ulmus americana*).
5,000 Scotch pine (*Pinus sylvestris*).
To the Western Nurseries, Calgary:—
5,000 White elm (*Ulmus americana*).

The latter shipment was made in return for some seed which had been donated to the Oliver nursery.

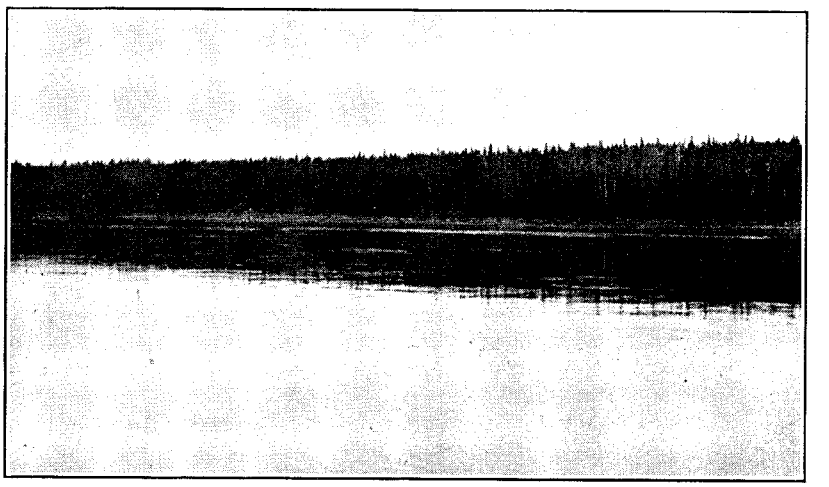
Of all the applicants, only two individuals failed to call at the express station for their trees, and in each case the railway company was instructed to give the trees to anyone who would pay the express charges.

A crew of eight, single, unemployed men was engaged for two days, under the direction of one of the forestry labourers from Oliver, in refilling the gaps in the avenue of trees between North Edmonton and Oliver, the first planting of which was made last year. It had been hoped to continue the work to Fort Saskatchewan, but the lateness of the saeson made this impracticable. Replacing of the casualties in last year's planting was all that could be done.

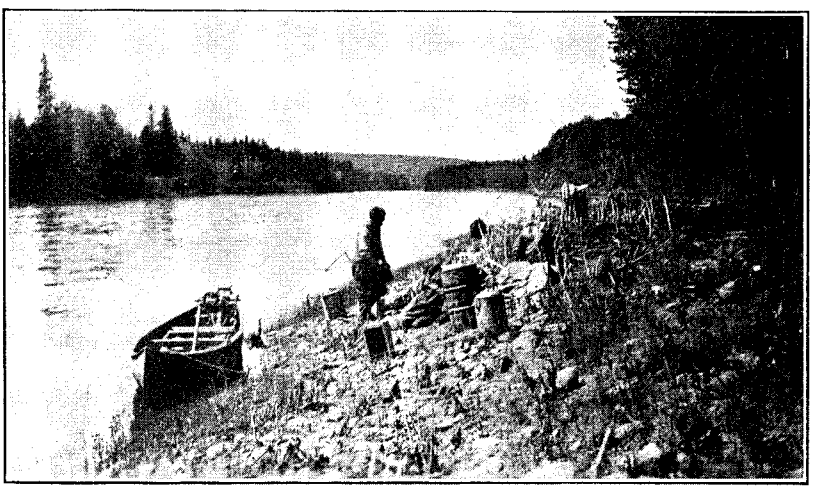
Publicity

During the past few years, the amount of publicity given to forest protection has been strictly limited. There is no change to report and the means available continues to be a limited contact with school children, contact with forest travellers, posters displayed throughout forested territory and articles of general forestry interest in the press. The results, considering the extent of the campaign, are satisfactory but only point to the desirability of a more extensive use of the agencies offering for this purpose. The opportunity to do a greater degree of good in the interest of forest protection offers itself through the right form of publicity. To be of value, this publicity must be a continuous and well sustained effort.

Public Relations.—Direct contact with the public comes about through requirements of forest protection and the disposal of forest resources. On both counts the situation is generally satisfactory, a feeling of understanding having been developed which in turn has in many instances led to unsolicited and mutually beneficial co-operation.



Timber stand on Wabisca River



Wabisca River below the Bad Rapids

MILEAGE TRAVELLED BY EMPLOYEES OF THE ALBERTA FOREST SERVICE

April 1st, 1934 to March 31, 1935

Divisions	Foot	Saddle	Driving	Speeder	Auto	Canoe	Rowboat	Motorboat	Railway	Raft	Dogteam	Total
Northern Alberta Forest District (Fire Rangers)	19,881	42,911	7,849	12,958	19,031	6,736	295	4,612	2,409	59	.....	116,741
Northern Alberta Forest District (Timber Inspectors)	3,577	1,262	3,109	2,701	66,539	198	13	2,118	13,316	.....	22	92,855
Clearwater Forest	5,911	10,754	2,193	1,539	10,814	.....	11	.....	1,151	.....	.....	32,373
Brazeau-Athabasca Forest	4,024	19,109	.....	5,879	1,840	.....	.....	.....	2,975	.....	.....	33,827
TOTALS	33,393	74,036	13,151	23,077	98,224	6,934	319	6,730	19,851	59	22	275,796

NOTE:—This statement accounts for the travelling done on forestry business by 83 men, the majority of whom were employed only during the fire season.

Fisheries

REPORT OF THE DIRECTOR OF FISHERIES, R. T. RODD

A review of the fiscal year ending March 31st, 1935 discloses a more healthy and prosperous situation for the Fisheries Division than has been evidenced for the three previous years.

During the period of this report several fishermen's conferences were attended with a view to amicably arranging details, which would remove much of the overlapping in production from various lakes, and in the marketing of fish for export trade together with the adjustment of regulations to meet the wishes of fishermen and the interests of the fisheries generally. Some attention was given to marketing problems and the possibilities of the Marketing Act as it applies to the fishing industry. Considerable assistance was given in this respect by the Dominion Government Trade Commissioner in New York, especially with regard to markets and the adjusting of difficulties existing between shippers and the eastern buyers, which was appreciated by the fisheries' interests.

The effect on the markets by over-production or over-lapping of production from various lakes was evidenced at one period during the winter, when during this time the price dropped some six cents per pound as the result of too much fish being placed on the markets at one time. Fortunately, this condition only lasted a few days, but it meant considerable loss to both the fishermen and the shippers. Incidentally, the careless handling and packing of fish by a few of the fishermen were causes for some complaint.

Angling during the year suffered to a certain extent from drought with the usual low water conditions reported in some districts. A number of the smaller streams in the southern part of the province were dangerously low in the latter part of August making it necessary to remove trout to more suitable waters. Early snowfalls, however, and rains in the beginning of September greatly improved conditions. A certain loss during the winter was reported as a result of streams freezing to the bottom.

An increase is shown in the number of angling permits and licenses issued during the year and also in the amount of fish taken. Further details of these particulars will be shown later in this report.

Commercial Fishing

Commercial fishing for the period under review amounted to a total of 4,059,436 pounds, an increase of 493,080 pounds over the previous year. The value of the year's catch to fishermen was $145,189.54, an increase of $14,065.19 over the previous year and the value as marketed was $244,070.77, an increase of $43,315.53.

The total production shows increases in winterfish, tullibee, pike and perch with decreases in trout, pickerel, sucker, ling, goldeye and mullet. Some new equipment was purchased and there was a renewal of licenses to fishermen who for one reason or another did not operate the previous year. A great many old nets are still in use after being patched up. In cases where new equipment was purchased dealers were more liberal in the extension of credit. Some new 4½" mesh nets were purchased at lakes where this class of mesh is permitted. These purchases were made as a result of better market conditions during the

latter part of the year fro the coarser varieties of fish. The number of fishermen operating at Pigeon and Wabamun lakes was very much increased, each of these lakes in fact, employing a greater number of operating fishermen than any other lake in the province. They are now considered to be the most popular, due in the first place to their closer situation to markets and in the second to their easy approach to railways.

Lesser Slave Lake.—This lake was heavily fished during the early part of the year resulting in a big increase of whitefish production. A considerable decrease, however, was noticeable in coarse fish due to the poor market for this variety during the summer months. Both pickerel and pike show decreases. The increase in whitefish taken approximates 245,000 pounds and the decrease in pickerel, 50,000 pounds. There was a large increase in both values to fishermen and values as marketed. The number of fishermen operating was reduced by 28 with an increase shown per capita per net for whitefish.

During December whitefish again showed an increase with a corresponding decrease in coarser varieties of fish. This was partly attributable to the fact that fishing for these coarser varieties was confined to smaller areas and that more fishermen were operating for whitefish only.

It is also recognized that whitefish are again becoming numerous and with profitable markets the fishermen were enabled to recuperate to some extent their former losses. Large decreases in every species were reported for the period January 1st to March 31st with the exception of perch fishing which shows an increase of approximately 21,000 pounds. The extraordinary severe winter which was experienced prevented fishing for many days, below zero weather and snow storms being general throughout the entire season. It is particularly gratifying to be able to report whitefish as more abundant than formerly, indicating that the restocking policies together with the restricted areas for the fishing of coarser varieties are having effect.

Lac La Biche.—Lac La Biche, the second most important lake in the province, was fished satisfactorily during the summer but poorly during the two winter periods. This lake is not considered to be a good winter fishing lake excepting for tullibee and the coarser species which are generally peddled throughout the province. During the summer, increases which were noted in all the varieties taken, were as follows:—whitefish, approximately 25,000 pounds, pickerel 48,000 pounds, pike 41,000 pounds and tullibee 19,000 pounds. Prices prevailing were fair to good. These increases are partly attributable to the fact that twenty-four more fishermen took out licenses. Most of the summer catch was exported to the United States. During December twenty less fishermen took advantage of the fishing with a correspondingly large decrease for all species recorded. The total reduction from December to March was approximately 118,000 pounds with lower values to fishermen and values as marketed.

During the winter fishermen in the Lac La Biche district were permitted to fish with 4½" mesh nets in the following lakes:—Blackett, Elinor, Frenchman, Ironwood, Jackson and Kinnaird, the catch running mainly to the coarser varieties such as pike, pickerel, perch and tullibee. Prices obtained were fair, exports being shipped mainly from Lac La Biche, the centre of this lake district. Due to the small variety of fish found in some of these lakes where the catch of whitefish is the exception rather than the rule, but where whitefish can be improved both in size and quantity, it was felt that the use of a 4½" mesh in certain areas would improve conditions by removing a quantity of the smaller and more destructive varieties of fish.

Cold Lake.—The winter catch at this lake showed an increase for the month of December of approximately 19,000 pounds of whitefish and a reduction of 13,000 pounds of trout with fifteen more fishermen operating. Better prices as a rule were obtained. From January 1st to March 31st approximately the same amount of fish was caught as in the previous year with seven less fishermen operating. Trout during this period increased by 5,000 pounds with whitefish showing a reduction of approximately 6,000 pounds. This lake is regarded always as steady in its production. Owing to the inclement winter weather prevalent throughout northern Alberta many of the pedlars arrived too late for the purchase of fish and in consequence very little of the production from either Cold or Primrose lakes was disposed of in this manner. Most of the fish caught during the year was exported.

Primrose Lake.—Primrose Lake, just north of Cold Lake, reported an increase of approximately 10,000 pounds of whitefish with five more fishermen operating in the small section of that water which is situated in Alberta. This portion of the lake is not favourably considered as a fishing area.

Big Whitefish Lake and Little Whitefish Lake No. 2.—These lakes were fished by twenty-eight fishermen with a slightly higher catch of whitefish. A small quantity of this production was shipped in a frozen state but prices as a rule ranged higher due to the majority of the fish being larger in size.

Pigeon Lake.—Fishing at Pigeon Lake was delayed until well into January because of market conditions and in order that the catch should be profitably marketed the length of mesh was reduced to 100 yards per license. In this way the catch was spread over a longer period. Pickerel production in comparison with last year showed an increase of over 10,000 pounds. A feature that assisted the production of this lake was the large increase of licenses issued, which totalled 374, an increase of 186 over the previous year. With the reduction of net yardage and increase of licenses permitted many farmers with numbers of their families applied for and received permission to fish which accounts in some degree for the larger number of licenses issued. The fish caught in this lake vary but little in size and are easily distinguishable from the whitefish caught in other lakes of the province. The product from Pigeon Lake is marketed without difficulty. In view of the large amount of domestic and Indian fishing during the summer and the great increase in the number of commercial licenses annually issued this lake must of necessity receive the acme of protection to prevent depletion.

Winnifred Lake.—Winnifred Lake was again fished during the month of December with an increased catch of 27,000 pounds of whitefish produced by four fishermen. The period from January 1st to March 31st showed an increase of roughly 25,000 pounds with fewer fishermen operating. The lake is apparently once more a large producer of whitefish due to the comparative rest it has received since the noticeable production of 1929. Most of the fish was marketed in the United States with good prices obtainable.

Wabamun Lake.—Wabamun Lake again produced heavily during the summer fishing, the catch for the early part of September being so heavy that fishermen were unable to handle the product satifactorily. Reports of fish poorly packed and iced were frequent. It is apparent that the product was full of spawn, was soft and in no condition to be shipped satisfactorily. The number of boats, ice houses and boxes were quite insufficient to provide for good marketing.

An increase of approximately 40,000 pounds of whitefish was produced during the summer with an additional forty-six licensed fishermen operating. The catch in December showed an increase of 53,000 pounds of whitefish with an increase of fifty fishermen employed. In the period from January 1st to March 31st a slight decrease of 6,000 pounds was shown although the increase of licenses issued numbered ninety-four. During this period the Department felt that this lake had already been too heavily fished with the result that a final catch of 50,000 pounds was decided upon which was taken in a very few days. During this period the amount of yardage permitted was reduced to sixty yards of gill nets per fisherman. Wabamun fish as a whole were intensely competed for throughout the entire year by both pedlars who were unable to get to the northern lakes as a result of poor roads and by dealers for the United States markets. Prevailing prices were high and good returns were obtained by fishermen. The proximity of the fishing stations to the railway and larger towns generally results in the fish from this lake being disposed of easily and in good condition. This was particularly so during the season under review with the exception of the September catch as previously stated.

Calling Lake.—Calling Lake provided thirty-two fishermen with good fishing during the month of December, a total of 116,000 pounds being caught. A closed season covering a period of three years for whitefish was made effective at this lake, an exception only being granted in favour of coarse fish in certain areas provided for by legislation. The whitefish catch per capita for this year was considered good, though the quality was not as marketable as that of other lakes. Distance to rail and poor road conditions are adverse factors. During December planes were used to market some of the catch for export trade and the fish arrived at the railhead in fair condition. From January 1st to March 31st owing to heavy snows and poor roads and in view of the small amount still to be taken to reach the limit permissible, fishing was very light, eight men only being employed during this period and an approximate amount of 7,000 pounds of whitefish taken. This catch, together with that of the pike and pickerel, was marketed locally.

Other lakes such as Moose, Wolf, McGregor, Newell, Pinehurst, Touchwood, Gregoire, Marie, Muriel, Keehiwin, Shining Bank and Bourque in the Lac La Biche, Wabamun and Cold Lake districts fished as usual with practically the same number of fishermen and with the same amount of fish taken out as heretofore. Generally speaking the catch from these smaller lakes is disposed of to pedlars or locally with the usual steady prices prevailing.

Equipment.—Some new equipment was purchased during the year. These purchases were made principally by the number of new fishermen operating. With reference to the use of boats, ice houses, etc., the men employed who were better off in such equipment shared on a mutual basis with those not so well situated. Generally speaking, the use of better equipment throughout this period was noticeable.

Markets.—A most satisfactory improvement regarding markets may be reported for the entire year under review. The total increase to fishermen amounted to $14,065.19 and the increase of value as marketed to $43,315.53 which reflected better markets prevailing. The Fisheries Division again co-operated with the fishermen and dealers by meeting their requirements when possible and granting extensions or closing seasons when and as the market warranted.

A complete check up was made by receiving information from all dealers with reference to the amount of fish which they individually exported with details covering varieties and prices obtained. It would appear that nearly 85% of the fish produced in this province is shipped to eastern markets. Any unusual factor of an adverse nature in these markets must therefore of necessity reflect seriously on the livelihood of the fishermen in this province. In this respect the facilities of the Canadian Trade Commissioner have been freely used and given with the result that the general trend in the east is for more co-operation with the western provinces in order to prevent overlapping. Local markets were well supplied with fish during the open seasons. Whitefish was disposed of freely and there were only one or two occasions when this fish could not be supplied in the green or fresh state when required. Local retail prices generally were lower having to meet competition of lower priced salt-water fish from the Pacific Coast.

Transportation.—Deep snows and poor road conditions with below zero weather prevented the usual facile methods of transportation evidenced as a result of great improvements during recent years. Many pedlars were unable to get their usual supply from favourite lakes. The freezing of fresh fish also occurred in some cases due to distance from railhead and instead of being exported in the fresh or green state necessarily had to be disposed of in a frozen condition. Planes were used to some extent to market fish caught at Calling Lake as road conditions were too difficult. In spite of the very cold weather and heavy snowfalls the product from Pigeon Lake was marketed in a fresh condition. Railway companies took great care to provide the necessary express cars when required.

Domestic Fishing.—The favourite lakes for this class of fishing are those approximating the good farm districts such as Wabamun, Pigeon, Buffalo, Chin and Buck. Lac La Nonne and Lac Ste. Anne are well fished from a domestic viewpoint, reports indicating that fishing was good throughout. Buck Lake stood out as an exception though prior to this year it had been very heavily fished. The total amount of all kinds of fish taken under domestic licenses amounted to 616,840 pounds with an estimated valuation of $35,343 as against a total of 411,250 for the year previous, an increase of 205,590 pounds. This is in the main due to the fact that more licenses were issued, namely a total of 654, as again the previous year's total of 508, an increase of 146.

Indian Fishing.—Fishing permits issued to Indians during this period totalled 842, a reduction of 68 from last year. The estimated amount of fish taken by the native population reached 1,106,275 pounds of all kinds with an estimated valuation of $57,976. A number of Indians fished commercially during the year. A close watch is kept by the various officers to see that fish caught under Indian permits are not disposed of commercially. Unscrupulous persons frequently take advantage of the opportunity of purchasing fresh whitefish caught in close season by Indians. Several prosecutions were instituted during the year against these offenders.

The following tables show the amount of fish exported from Alberta during the past year to various eastern markets:—

FISH SHIPPED DURING THE SUMMER SEASON OF 1934

Destination	Trout, lbs.	Whitefish, lbs.	Pickerel, lbs.	Pike, lbs.	Perch, lbs.	Tullibee, lbs.	Pickerel Fillets, lbs.	Total lbs.
Chicago	.....	565,920	196,478	44,925	11,800	11,713	30,110	860,946
New York	.....	251,520	149,959	53,042	17,514	3,530	.....	475,565
Montreal	.....	6,226	15,982	3,360	1,262	1,346	.....	28,176
TOTALS	.....	823,666	362,419	101,327	30,576	16,589	30,110	1,364,687

FISH SHIPPED DURING THE WINTER SEASON OF 1934-35

Chicago	28,200	497,502	97,341	130,644	31,242	32,916	.....	817,845
New York	13,756	389,557	140,432	112,778	49,864	25,793	.....	732,180
Montreal and Toronto	6,150	4,110	600	.....	.....	.....	.....	10,860
Minneapolis	.....	8,080	12,996	1,070	250	.....	.....	22,396
TOTALS	48,106	899,249	251,369	244,492	81,356	58,709	.....	1,583,281

FISH SHIPPED DURING THE FISCAL YEAR 1934-35

Summer Season	.....	823,666	362,419	101,327	30,576	16,589	30,110	1,364,687
Winter Season	48,106	899,249	251,369	244,492	81,356	58,709	.....	1,583,281
TOTALS	48,106	1,722,915	613,788	345,819	111,932	75,298	30,110	2,947,968

NOTE: The total of 48,106 lbs., trout, as shown above, represents the amount exported from Cold Lake during the winter season from both Alberta and Saskatchewan portions of the lake.

TOTAL AMOUNT OF FISH TAKEN FOR COMMERCIAL PURPOSES—IN ORDER OF IMPORTANCE

Classification	Period	Weight	Lbs.	Value to Fishermen		Value as Marketed	
WHITEFISH	May 16/34 to Sept. 30/34	934,968		$ 43,030.36		$ 78,958.38	
	Dec. 1/34 to Dec. 31/34	515,530		19,095.50		36,412.00	
	Jan. 1/35 to March 31/35	495,723		31,089.00		45,213.00	
			1,946,221		$ 93,214.86		$160,583.38
LAKE TRUT	May 16/34 to Sept. 30/34	.....		.....		.....	
	Dec. 1/34 to Dec. 31/34	12,616		$ 698.00		$ 1,384.00	
	Jan. 1/35 to March 31/35	19,843		1,203.00		2,322.00	
			32,459		1,901.00		3,706.00
PIKE	May 16/34 to Sept. 30/34	230,695		$ 2,529.27		$ 2,572.27	
	Dec. 1/34 to Dec. 31/34	197,803		4,049.00		4,725.00	
	Jan. 1/35 to March 31/35	315,060		5,551.00		7,425.00	
			743,558		12,129.27		14,722.27
PICKEREL	May 16/34 to Sept. 30/34	507,511		$ 15,738.06		$ 30,739.12	
	Dec. 1/34 to Dec. 31/34	34,523		1,142.00		1,791.00	
	Jan. 1/35 to March 31/35	164,687		10,077.00		14,790.00	
			706,721		26,957.06		47,320.12
TULLIBEE	May 16/34 to Sept. 30/34	99,749		$ 1,001.00		$ 1,101.00	
	Dec. 1/34 to Dec. 31/34	32,775		494.50		751.00	
	Jan. 1/35 to March 31/35	122,143		3,328.00		5,327.00	
			254,667		4,823.50		7,179.00
PERCH	May 16/34 to Sept. 30/34	52,164		$ 1,671.10		$ 3,083.00	
	Dec. 1/34 to Dec. 31/34	4,335		212.00		281.00	
	Jan. 1/35 to March 31/35	65,364		2,898.00		5,566.00	
			121,863		4,781.10		8,930.00
SUCKER, LING, GOLDEYE, MULLET	May 16/34 to Sept. 30/34	131,546		$ 481.00		$ 481.00	
	Dec. 1/34 to Dec. 31/34	37,025		279.75		280.00	
	Jan. 1/35 to March 31/35	85,376		622.00		869.00	
			253,947		1,382.75		1,630.00
	TOTALS	4,059,436	4,059,436	$145,189.54	$145,189.54	$244,070.77	$244,070.77

Licenses and Permits.

With the exception of Indian permits, there was a large increase in all kinds of licenses issued during the year. The following summary shows the number of licenses and permits issued during the last five years:—

Fiscal Year	*1930-31	1931-32	1932-33	1933-34	1934-35	Total
Domestic licenses	566	555	458	508	654	2,741
Fishermen's and commercial licenses	1,033	755	598	746	1,296	4,428
Angling permits sold by Fisheries Division	7,731	6,533	4,963	4,823	5,015	29,065
Angling permits sold by Forestry Division	.....	566	478	397	475	1,916
Indian permits	1,130	736	860	910	842	4,478
Boat licenses	.....	.....	.....	.....	33	33
TOTALS	10,460	9,145	7,357	7,384	8,315	42,661

LICENSES AND PERMITS, FISCAL YEAR 1934-35, IN COMPARISON WITH PREVIOUS YEAR

	Increase
Domestic licenses	146
Fishermen's and commercial licenses	550
Angling permits sold by Fisheries Division	192
Angling permits sold by Forestry Division	78
Boat licenses	33
	999
Less decrease in Indian permits	68
Net Increase	931

*Six months to March 31.

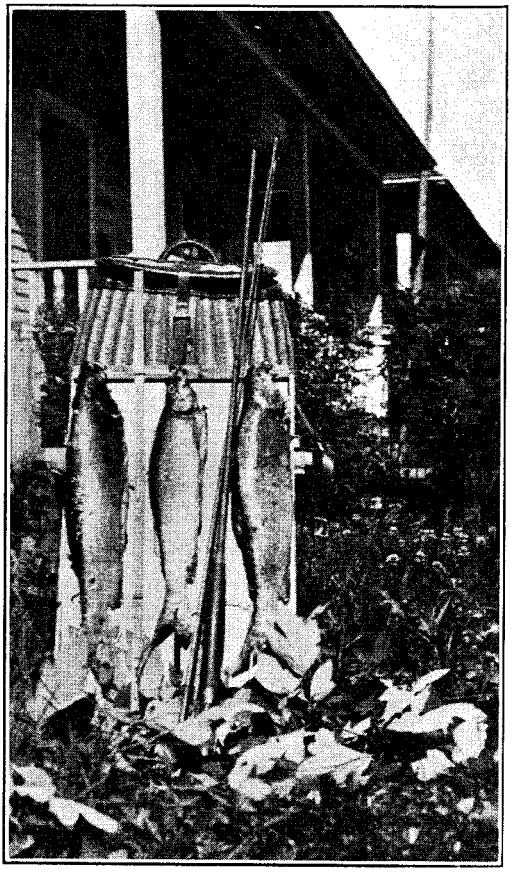
Angling.—The increase of 270 in the sale of angling permits for this year reveals also an increase of 65,589 pounds in the year's catch for trout, Rocky Mountain whitefish and Arctic grayling. The extremely cold weather and heavy snows during the entire winter season, however, affected the amount of coarse fish taken. It was quite impossible for anglers living in cities and situated some distance away from the more popular lakes to reach these favourite spots and only a minimum of winter fishing was therefore enjoyed. Fishing for rainbow, cutthroat and other types of game fish was exceptionally good in the Highwood, Bow, Elbow and Edson districts and reports from southern Alberta indicated that rainbow trout were thriving and giving greater sport than ever. Fishing in this part of Alberta was in many respects better than it has been for years.

FISH CAUGHT BY ANGLERS, 1934-35

Trout	261,989 lbs.	35,989 lbs.	increase
Rocky Mountain Whitefish	100,000 "	21,000 "	increase
Arctic grayling	58,600 "	8,600 "	increase
Goldeye	24,900 "	17,170 "	increase
Pickerel	102,350 "	47,650 "	decrease
Perch	288,905 "	58,905 "	increase
Pike	561,059 "	184,941 "	decrease
TOTAL	1,397,803		

or a decrease of 90,927 lbs. on the year's operations.

As already stated, an increase appeared in the number of angling permits issued and the total weight of the game fish catch. In the above table it will also be noted that increases appear in the catches of all species with the exception of pickerel and pike, the decreases of which are sufficiently heavy to show a general decrease for the year's total.

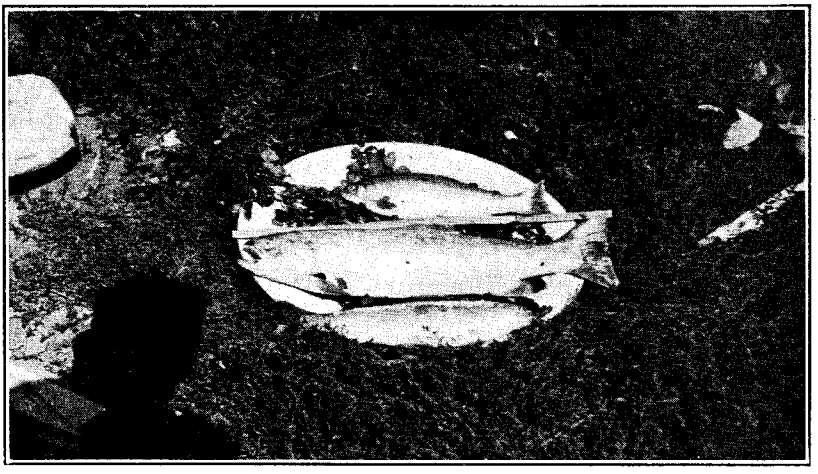


Arctic Grayling caught in Christina River near Conklin, Alberta

Loss of Fish—Rescuing Fish.—The serious drought conditions in southern Alberta during the last few seasons have been the cause of much apprehension and have involved the loss of a certain amount of game fish. During the season under review, however, some streams, which in previous years have been dangerously low, were in much better condition, while on the other hand certain districts, where previous to this season there had been no drought, experienced streams which went completely dry.

While some of the streams in the Crowsnest were fairly low, none went completely dry, which was a considerable improvement over the previous year. A section of Willow Creek and the north fork of Fish Creek went dry for a short period during the latter part of August but very little loss was evidenced as the disappearance of the water was so gradual that most of the fish escaped without assistance and the fishery guardians, anticipating such an occurrence, were prepared, and did rescue a number of fish that were likely to become stranded.

The early snowfall and wet weather in September greatly improved conditions and all streams south of the Bow River, with the exception of Fish Creek, were in good condition during the fall and winter. Some loss was reported in Fish Creek during the winter caused by water freezing to the



Rainbow trout caught in Bow River, four miles west of Carseland Dam. Centre fish weighs 4¾ lbs., length 24 inches.

Rainbow trout caught in the Elbow River. Length 22 inches.

bottom and deep pools becoming stagnant as a result. In the district west of Olds and Innisfail several tributaries of the Red Deer River went dry during midsummer, and others which continued to flow during the summer months froze to the bottom during the winter, causing no doubt considerable loss, which could not possibly be prevented.

Surveys of the district were made during the early fall and in the month of March, with a view to determining what loss occurred and also to obtain information beneficial for stocking operations.

The number of fish rescued during the summer season was as follows:

North Fork of Fish Creek—230 trout.
Tributaries of the Highwood River—123 trout, 33 Rocky Mountain whitefish.
North Fork of Willow Creek—400 trout, 60 Rocky Mountain whitefish.

Predaceous Fish Removed from Trout Waters.—The number of predaceous fish removed from trout waters throughout the year was not so large as in previous years dut to the heavy removals of other seasons. The greatest numbers taken this year were from waters from which none had been previously removed.

Some assistance in this work was given by fur farmers, who required the suckers to feed their fur-bearing animals. During 1934 the following predaceous fish were removed from game fish waters:—

	Dolly Varden	Pike	Sucker	Ling	Total
Twin Butte area (Guardian Allred)	.....	.....	70	.....	70
Willow Creek area (Guardian Comrie)	10	104	769	.....	883
High River area (Guardian Smith)	8	.....	742	8	758
Elbow River area (Guardian Fullerton)	.....	21	2,125	.....	2,146
Sundre area (Guardian Thompson)	.....	820	1,398	.....	2,218
Calgary district (Inspector Richardson)	.....	23	8,444	20	8,487
TOTALS	18	968	13,548	28	14,562

Observance of Regulations.—Prosecutions during the year totalled 60, a decrease of 2, and confiscations of illegal gear amounted to 59, or an increase of 6.

The following is a summary of the prosecutions which materialized during the year:—

Fishing without a license	11
Operating too much yardage	10
Fishing in closed season	10
Use of nets in closed streams	5
Having illegally caught fish in possession	4
Using illegal apparatus	4
Offering for sale illegally caught fish	3
Fishing without a permit	3
Fishing in a closed stream	3
Fishing with unbaited hooks	2
Having undersized trout in possession	1
Pollution of stream	1
Having no license numbers on nets	1
Operating a dam without a proper fishway	1
Fishing with a set line	1
TOTAL	60

Irrigation.—A close check is still continued by the various Fisheries officers on the forty-five irrigation schemes which are drawing their water supply from streams or rivers containing fish. Complaints were received regarding two of these where loss of fish was claimed. The complaints are being given the necessary attention. In addition to the schemes already in existence, the ninety-three applications for the right to divert water for domestic and industrial purposes were dealt with. As the greater number of these applications were for permission to dam coulees and non-perennial streams to conserve the spring run-off and a small number for the right to pump water from larger rivers for domestic, industrial or irrigation purposes, none would be detrimental to the fisheries. All applications were therefore approved.

Dams and Fishways.—Although there have been suggestions that fishways or passes should be provided in the large dams in the Bow River and the Glenmore Dam in the Elbow River near the city of Calgary, investigations have proven that these dams are not detrimental to the fisheries, except that a few more fish have been taken immediately below than would be the case if these dams were not in existence. On the other hand the Glnmore Dam in the Elbow River is beneficial to the trout fisheries in that river, as it is preventing great numbers of pike and suckers from ascending into the upper reaches, while very few trout, with the exception of Dolly Varden, are ever taken below the dam.

The Calgary Power Company's dam at the Ghost River possibly prevents some trout from ascending the river, but on the other hand, the large lake above the dam should eventually become one of the finest fishing areas in the province, and should also improve the fishing in the Ghost River. The possibility of installing a fish pass or ladder in this dam has been given serious consideration, but owing to the fluctuation in water levels in the lake above the dam, a fish ladder would be of little or no benefit. A natural channel has been created from the south spillway which if given a little attention from time to time, will be a much more efficient fishway or pass than any fish ladder that can be constructed. The Power Company has agreed to co-operate in seeing that this channel is kept in condition to enable fish to pass upstream when the water is flowing over the spillway.

The Carseland dam owned by the Canada Land and Irrigation Company possibly may prevent a few trout which have been carried down by high water from returning upstream. On the other hand, this dam prevents large numbers of pike and suckers from entering trout waters, and is therefore more beneficial than otherwise. In any case, a large fishway is provided, over which the trout may pass without difficulty.

Pollution of Streams.—Complaints are still being received with regard to pollution of the Bow River at Calgary. It is claimed by some that the oil refineries are responsible whilst others attribute this pollution to the sewage from the city. The matter has been investigated on various occasions, and both the oil refineries and the city have gone to considerable expense to remedy the situation. The city has spent a large amount of money on a sewage disposal plant, while the oil refineries have also spent considerable money in trying to prevent oil or other matter from the refineries entering the river. The condition is not yet all that could be desired, but it is hoped with the continued investigations and careful operation of the sewage plants and the oil refineries, that in the near future the cause of complaint will be entirely eliminated.

In a previous report reference was made to the fact that oil and grease entering the sewers from garages and service stations was the greatest cause for complaint. With the methods now in use at the sewage disposal plant, this objection is now removed.

No other difficulties were experienced during the year. One prosecution, for a minor offence, was the only one in evidence.

Fish Culture

The co-operation of the federal Department of Fisheries and the National Parks Branch of the Department of the Interior in the hatching and distribution of game fish fry and fingerlings from various hatcheries in the national parks was again freely given, and greatly appreciated. It was possible, by such co-operation, for this Department to carry on the re-stocking of trout waters outside

the national parks without difficulty. Owing to the lack of necessary funds, the whitefish hatchery at Lesser Slave Lake was not operated during the year.

The continued drought in the southern part of the province was again the cause of considerable worry and necessitated the exercising of great care in the distribution of fry into streams. Many of these streams were again dangerously low, a few drying up altogether during July and August. It was discovered, however, that by taking proper precaution the loss of any fish during the season was prevented. Inspectors and guardians patrolling the streams regularly and observing conditions were in a position to advise the hatchery superintendents as to which streams were dangerously low or which showed indications of going dry.

As stated in the 1933-34 report, arrangements were made through the Department of Fisheries, Ottawa, for a supply of trout eggs for the 1934 distribution. Eyed eggs ordered for delivery were as follows:—

To Waterton hatchery	700,000	rainbow trout
	300,000	cutthroat trout
To Banff hatchery	450,000	rainbow trout
	400,000	cutthroat trout
	500,000	Loch Leven trout
	100,000	speckled trout
To Jasper hatchery	200,000	rainbow trout

The Loch Leven and speckled trout eggs were delivered to the Banff hatchery in excellent condition. Details of the distribution resulting from the hatching of these eggs are shown later in this report.

Owing to the very poor quality of the rainbow eggs received from Pocatello, Idaho, where the loss at both Banff and Waterton hatcheries were very heavy, settlement was only made for those eggs which developed to swimming fry and an additional supply was obtained from other sources to make up the loss. Out of 450,000 rainbow eggs ordered from Pocatello for delivery at the Banff hatchery only 42,630 were paid for. Of the 700,000 rainbow eggs ordered for delivery at the Waterton hatchery only 284,760 were delivered and 31,000 paid for.

The 200,000 rainbow eggs ordered for delivery at the Jasper hatchery for this Government were included with a shipment for the Dominion Parks Branch, making a total of 525,600 eggs received at the Jasper hatchery. The loss in these eggs was also very heavy and settlement was only made for the number that hatched and survived. No further supply could be obtained to augment this loss with the result that the Parks Branch generously agreed to apportion the fry at distribution stage on a percentage basis. Under this arrangement, the Alberta Government obtained 120,000 swimming fry, which was a greater number than could possibly have been obtained from the 200,000 eggs ordered.

To make up the loss, an additional supply of 450,000 eyed rainbow eggs were ordered from Troy, Montana, for delivery at the Banff hatchery and 600,000 for delivery at the Waterton hatchery. From those delivered at the Banff hatchery, 24,128 loss occurred in the first fifteen days, leaving a balance of 425,880 to be paid for. At the Waterton hatchery 613,500 eggs were received, the loss in this lot for the first fifteen days being 38,700. The number of eggs paid for totalled 574,800.

By an exchange of eggs, the Department of Fisheries, Ottawa, was able to obtain from the United States Bureau of Fisheries 456,000 eyed cutthroat trout eggs from Yellowstone Park for delivery to the Waterton hatchery and 557,700 for delivery to the Banff hatchery in addition to 669,395 received from Troy, Montana. After the usual loss through handling and other causes,

306,000 were allotted to the Provincial Government at the Waterton hatchery and 430,425 at the Banff hatchery.

The number of plantings during the year from the Waterton hatchery into provincial waters was 72, as compared with 53 for the previous year, an increase of 19. The plantings from the Banff hatchery totalled 96, as compared with 89 for the previous year, an increase of 7, while the plantings from the Jasper hatchery show a decrease of 15, only 11 plantings being made, as compared with 26 for the previous year. The number of fry and fingerlings distributed into waters outside the national parks shows a total of 2,361,865, an increase of 181,015 over the previous year.

Details of the distribution from the various hatcheries into waters outside the national parks are as follows:—

WATERTON

RAINBOW TROUT

Name of Waters	Fry	Advanced Fry	Fingerlings No. 1
Tributaries to Castle River:—			
Beaver Dams (Screwdriver Creek) (sec. 24, t. 4, r. 4, w5m., sec. 6, t. 5, r. 3, w5m., sec. 36, t. 4, r. 4, w5m.)*	.....	.....	25,000
Carbondale River	.....	.....	10,000
Link Creek	.....	.....	5,000
Unnamed Creek (sec. 14, t. 6, r. 4, w5m)*	.....	.....	5,000
Unnamed Creek (sec. 4, t. 5, r. 3, w5m)*	.....	.....	10,000
Unnamed Creek (sec. 3, t. 5, r. 3, w5m)*	.....	.....	10,000
Beaver Lake (sec. 11, t. 5, r. 3, w5m)*	.....	.....	10,000
Beaver Dams (sec. 2, t. 5, r. 3, w5m)*	.....	.....	10,000
Beavermines Creek (sec. 19, t. 5, r. 2, w5m., sec. 13, t. 5, r. 3, w5m)*	.....	.....	20,000
Gladston Creek	.....	15,000	.....
Mill Creek	.....	20,000	.....
Tributaries to Crowsnest River:—			
Allison Creek	.....	15,000	.....
Byron Creek	.....	10,000	.....
Star Creek	.....	5,000	.....
Blairmore Creek	.....	20,000	.....
Gold Creek	.....	15,000	.....
Todd Creek	.....	25,000	.....
Crowsnest Lake	.....	30,500	.....
Crowsnest Lake	.....	13,400	.....
Tributaries to Willow Creek:—			
Riley Creek	.....	.....	2,500
Langford Creek	.....	.....	2,500
Nelson Creek	.....	.....	5,000
Chaffin Creek	.....	.....	5,000
Westrup Creek	.....	.....	5,000
South Fork Willow Creek	.....	.....	20,000
Burke Creek	.....	.....	20,000
Trout Creek	.....	25,000	.....
Patterson Creek	.....	5,000	.....
Burton Creek	.....	10,000	.....
Lyndon Creek (sec. 15, t. 13, r. 1, w5m)*	.....	5,000	.....
Lyndon Creek (sec. 23, t. 12, r. 29, w4m)*	.....	5,000	.....
Lyndon Creek (sec. 26, t. 12, r. 29, w4m)*	.....	5,000	.....
Lyndon Creek (sec. 7, t. 13, r. 29, w4m)*	.....	10,000	.....
North Fork Willow Creek	.....	15,000	.....
Johnson Creek	.....	10,000	.....
Tributaries to Waterton River:—			
Pine Creek	.....	10,000	.....
Cottonwood Creek	20,000	.....	.....
Trail Creek	5,000	.....	5,000
Smith Creek	.....	5,000	10,000
Yarrow Creek	.....	.....	8,000
Drywood Creek	.....	15,000	.....
Carpenter Creek	.....	10,000	.....
Spring Creek	.....	10,000	.....
Tributaries to Oldman River:—			
Pincher Creek	.....	30,000	.....
Unnamed Waters (sec. 16, t. 7, r. 2, w5m)*	500	.....	.....
Unnamed Waters (sec. 15, t. 4, r. 30, w5m)*	500	.....	.....
Lee Lake	.....	.....	5,000
TOTAL	26,000	338,900	193,000

WATERTON

CUTTHROAT TROUT

Name of Waters	Fry	Advanced Fry	Fingerlings No. 1
Tributaries to St. Mary's River:—			
Tough Creek	.....	.....	12,500
Lee Creek	.....	.....	12,000
Tributaries to Oldman River:—			
Racehorse Creek	.....	.....	30,000
Station Creek	.....	5,000	10,000
Beaver Dams (sec. 8, t. 11, r. 3, w5m)*	.....	.....	40,000
Ernst Creek	.....	5,000	.....
Beaver Dáms (sec. 32, 33, t. 10, r. 3, w5m)*	.....	25,000	.....
Playle Creek	.....	5,000	.....
Callum Creek	.....	10,000	.....
Adair Creek	.....	5,000	.....
Burton Creek (sec. 1, t. 12, r. 2, w5m)*	.....	5,000	.....
Damon Creek	.....	5,000	.....
Sharples Creek	.....	5,000	.....
Spring Creek	.....	5,000	.....
Bobs Creek	.....	15,000	.....
Olin Creek	.....	5,000	.....
Heath Creek	.....	10,000	.....
Beaver Creek (sec. 5, t. 10, r. 30, sec. 1, t. 10, r. 30, sec. 18, t. 9, r. 30, sec. 30, t. 9, r. 30, w4m)*	.....	30,000	.....
Unnamed Waters (sec. 15, t. 4, r. 30, w4m)*	500	.....	.....
Tributaries to Livingstone River:—			
Unnamed Creek (sec. 36, t. 12, r. 4, w5m)*	.....	.....	5,000
Twin Creek	.....	.....	10,000
Coat Creek	.....	.....	10,000
Bovin Lake (sec. 19, t. 3, r. 1, w5m)*	.....	.....	5,000
No Outlet	.....	.....	.....
TOTAL	500	135,000	134,500

BANFF

RAINBOW TROUT

Name of Waters	Fry	Fingerlings No. 1	Fingerlings No. 2
Tributaries to Milk River:—			
Battle Creek	.....	20,000	.....
Greyburn Creek	.....	10,000	.....
Tributaries to Bow River:—			
Bear Creek	.....	20,000	.....
Sibbald Creek	.....	20,000	.....
Spring Creek	.....	12,630	.....
Tributaries to Sheep Creek:—			
Blue Rock Creek	.....	.....	10,000
Canyon Creek	.....	.....	10,000
Fisher Creek	.....	.....	20,000
Gorge Creek	.....	.....	10,000
Junction Creek	.....	.....	20,000
King Creek	.....	.....	5,000
North Sheep Creek	.....	.....	15,000
South Sheep Creek	.....	.....	20,000
Spring Creek	.....	.....	10,000
Ware Creek	.....	.....	10,000
Tributaries to Elbow River:—			
Bragg Creek	.....	19,355	.....
Lotts Creek	.....	.....	15,900
Mays Creek	.....	.....	15,900
Mickle Creek	.....	10,000	.....
Pirmez Creek	.....	19,355	.....
Pirmez Creek	.....	.....	10,600
Rennick Creek	.....	10,000	.....
Robinson Creek	.....	.....	10,600
Stringer Creek	.....	10,000	.....
Young Creek No. 1	.....	5,000	.....
Tributaries to Highwood River:—			
Cataract Creek	.....	.....	30,000
Etherington Creek	.....	.....	30,000
Pekisko Creek	.....	.....	30,000
Sennet Creek	.....	.....	10,000
Tributary to Oldman River:—			
North Willow Creek	.....	.....	20,000
TOTAL	.....	146,340	303,000

BANFF

CUTTHROAT TROUT

Name of Waters	Fry	Fingerlings No. 1	Fingerlings No. 2
Tributaries to Bow River:—			
Big Hill Creek	.....	.....	30,000
Bowfort Creek	.....	10,000	.....
Cold Creek	.....	25,000	.....
Exshaw Lakes	.....	30,000	.....
Gap Creek	.....	10,000	.....
Ghost Lake	.....	.....	30,000
Jumping Pound Creek	.....	.....	10,425
Muskeg Creek	.....	.....	10,000
Policeman's Creek	.....	20,000	.....
Spencer Creek	.....	10,000	.....
Tributaries to Elbow River:—			
Crawford Creek	.....	5,000	.....
Fullerton Creek	.....	5,000	.....
Hidden Creek	.....	.....	10,000
McLean Creek	.....	.....	10,000
Prairie Creek	.....	.....	20,000
Ranger Creek	.....	.....	10,000
Sylvester Creek	.....	.....	20,000
Thomas Creek	.....	.....	10,000
Young Creek No. 2	.....	5,000	.....
Tributaries to Ghost River:—			
Eau Clair Creek	.....	30,000	.....
Haymeadow Creek	.....	.....	30,000
Tributaries to Highwood River:—			
Flat Creek	.....	30,000	.....
Sullivan Creek	.....	30,000	.....
TOTAL	.....	210,000	190,425

BANFF

LOCH LEVEN TROUT

Name of Waters	Advanced Fry	Fingerlings No. 1	Fingerlings No. 2
Tributaries to Clearwater River:—			
Alford Creek	.....	10,000	.....
Clear Creek	.....	10,000	.....
Cold Creek	.....	10,000	.....
Moose Creek	.....	10,000	.....
Muskeg Creek	.....	10,000	.....
South Prairie Creek	.....	10,000	.....
Suhr Creek	.....	5,000	.....
North Prairie Creek	.....	10,000	.....
Tributaries to Red Deer River:—			
Bear Creek	.....	5,000	.....
Bearberry Creek	.....	20,000	.....
Beaver Creek	.....	10,000	.....
Chapman's Spring	.....	10,000	.....
Dennison Creek	.....	5,000	.....
Dog Pound Creek	15,000	.....	.....
East Stony Creek	.....	20,000	.....
Gastle Creek	.....	2,500	.....
Gibson Creek	.....	5,000	.....
Grant Creek	.....	2,500	.....
Griswald Creek	.....	5,000	.....
Horseshoe Lake No. 1	.....	5,000	.....
Horesshoe Lake No. 2	.....	5,000	.....
Little Beaver Creek	.....	5,000	.....
Little Red Deer River	.....	19,200	.....
South Raven Creek	.....	20,000	.....
Spring Creek	.....	15,000	.....
Stever Creek	.....	12,500	.....
Twin Spring	.....	5,000	.....
Waltermeyer Creek	.....	2,500	.....
Wammick Lake No. 1	.....	5,000	.....
Wammick Lake No. 2	.....	5,000	.....
Wammick Lake No. 3	.....	5,000	.....
Wammick Lake No. 4	.....	2,500	.....
Wammick Lake No. 5	.....	2,500	.....
Swanson Creek	5,000	.....	.....
Birch Lake (sec. 18, t. 35, r. 6, w5m)*	.....	.....	.....
No Outlet	.....	20,000	.....
Tributaries to Baptiste River:—			
Chambers Creek	.....	20,000	.....
Lawrence Creek	.....	12,000	.....
Ruth Creek	.....	12,000	.....

	Advanced Fry	Fingerlings No. 1	Fingerlings No. 2
Tributaries to North Saskatchewan River:—			
Fish Lake	.....	10,000	.....
Goldeye Lake	.....	30,000	.....
Wabamun Lake	40,000	.....	.....
Tributary to Battle River:—			
Pigeon Lake	40,000	.....	.....
TOTAL	100,000	373,200	.....

BANFF

SPECKLED TROUT

Name of Waters	Advanced Fry	Fingerlings No. 1	Fingerlings No. 2
Tributaries to Red Deer River:—			
South Raven Creek	.....	6,000	.....
Cold Lake	85,000	.....	.....
TOTAL	85,000	6,000	.....

JASPER

RAINBOW TROUT

Name of Waters	Advanced Fry	Fingerlings No. 1	Fingerlings No. 2
Sansell Lake (s.w. ¼ sec. 8, t. 53, r. 19, w5m), no outlet	10,000	.....	.....
Tributaries to McLeod River:—			
Howey Creek	5,000	.....	.....
Obed Lake	15,000	.....	.....
North Branch Edson River	20,000	.....	.....
Bench Creek	10,000	.....	.....
Little Wolf Creek	10,000	.....	.....
Carrot Creek	10,000	.....	.....
Tributaries to Sundance River:—			
Horse Creek	10,000	.....	.....
Little Hornbeck	15,000	.....	.....
Tributary to Lobstick River:—			
Brule Creek	5,000	.....	.....
Deacon Lake (sec. 9, t. 53, r. 15, w5m), no outlet	10,000	.....	.....
TOTAL	120,000	.....	.....

RECAPITULATION

Hatchery	Fry	Advanced Fry	Fingerlings No. 1	Fingerlings No. 2
Waterton	26,500	473,900	327,500	.....
Banff	.....	185,000	735,540	493,425
Jasper	.....	120,000	.....	.....
TOTALS	26,500	778,900	1,063,040	493,425

Fry	26,500
Advanced Fry	778,900
Fingerlings No. 1	1,063,040
Fingerlings No. 2	493,425
Total distribution from the three hatcheries for the fiscal year ended March 31st, 1935	2,361,865

*Sec.—section, t.—township, r.—range, w4m—west of the 4th meridian.

In order to be assured of a supply of trout for distribution for the 1935 season, arrangements were again made during the month of October for a supply of eggs for next season's stocking. Instead of making these arrangements through the Department of Fisheries, this Department made arrangements for the purchase of the eggs direct with the dealers. The following are the numbers arranged for in October for delivery at the various hatcheries:—

Hatchery	Number	Species
Waterton	900,000	Rainbow trout eyed eggs
Waterton	400,000	Cutthroat trout eyed eggs
Banff	600,000	Speckled trout eyed eggs
Banff	550,000	Rainbow trout eyed eggs
Banff	475,000	Cutthroat trout eyed eggs
Jasper	200,000	Rainbow trout eyed eggs
TOTAL	3,125,000	

The speckled trout eggs were ordered for delivery at the Banff hatchery in January and the rainbow and cutthroat eggs for May and June at the three hatcheries mentioned.

Lesser Slave Lake Hatchery.—The Lesser Slave Lake hatchery, owing to economic reasons, was not operated during the year. Some repairs, however, were carried out during the summer and new steel girders installed over the engine room to replace timbers which by warping had allowed the upper floors to sag. Permanent marine ways were also made to enable motor boats to be launched, or drawn out for the winter, without difficulty or damage. Considerable tree planting was carried out and the grounds improved generally, as well as a year's supply of cordwood obtained for fuel for the boilers in order to be in readiness should it be decided on short notice to again put the hatchery in operation. For the same reason all machinery and equipment were kept in first class condition. With the exception of rubber boots and waterproof clothing very little supplies or equipment would be required to place the hatchery in operation.

In addition to the re-stocking carried on from the various trout hatcheries, the following waters were examined with a view to stocking should they be found suitable for fish life:—

Name of Lake	Location
Hoselaw Lake	Sec. 23, t. 59, r. 7, w4m.
Lake No. 2	S.E. ¼ sec. 6, t. 46, r. 3, w5m.
Bittern Lake	T. 46 and 47, r. 21 and 22, w4m.
Looking Back Lake	T. 50, r. 22, w4m.
Laurier Lake	Secs. 21 and 22, t. 56, r. 4, w4m.
Coal Lake	T. 47 and 48, r. 23, w4m.
Conjuring Lake	T. 48, r. 27, w4m.
Lake No. 1	Sec. 6, t. 48, r. 8, w4m.
Two unnamed lakes	Sec. 8 and 16, t. 19, r. 14, w4m.
Taylor's Pond	S.E. ¼ sec. 7, t. 27, r. 2, w5m.
Dyck's Pond	N.W. ¼ sec. 31, t. 21, r. 15, w4m.
Sterling Lake	Sec. 2, t. 54, r. 1, w5m.
Lake Charron	T. 67 and 68, r. 17, w4m.
Reumiller Lake	Sec. 8, t. 26, r. 26, w4m.

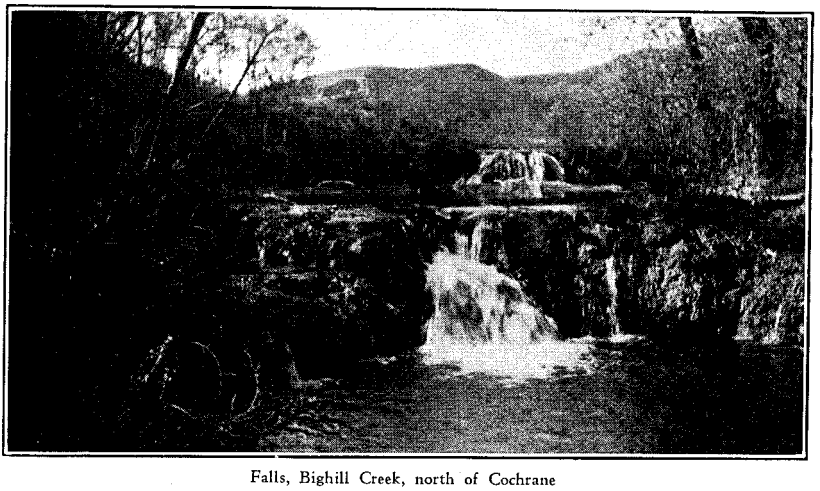
Of these lakes examined seven were found to be unsuitable for any species of fish and three were found to already contain pike but were suitable for other species. Five, while not containing any fish, were found to be suitable for stocking.

During the season in addition to these inspections the following lakes were stocked with perch, pickerel and pike by transfer from other lakes:—

Name of Lake	Location
Sterling Lake	Sec. 2, t. 54, r. 1, w5m.
Reid Lake	Sec. 12, t. 54, r. 1, w5m.
Glory Lake	Sec. 22, t. 53, r. 1, w5m.
Astotin Lake	T. 54, r. 20, w4m.
Altheim Lake	Sec. 13, t. 52, r. 2, w5m.
Cardinal Lake	T. 83, r. 24, w5m.
Cappier Lake	Sec. 30, t. 38, r. 5, w4m.
Hales Lake	Sec. 3 and 10, t. 38, r. 6, w4m.
Lake Saskatoon	T. 72, r. 7 and 8, w6m.
Brightbank Lake	Sec. 23, t. 51, r. 2, w5m.
Nakamun Lake	T. 56, r. 2, w5m.
Lake Mere	Sec. 32, t. 53, r. 1, w5m.
Armstead Lake	Sec. 13, t. 53, r. 2, w5m.
McArthur Lake	Sec. 20, t. 53, r. 6, w5m.
Arnault Lake	Sec. 31, t. 54, r. 6, w5m.
Camp Lake	Sec. 10 and 15, t. 48, r. 11, w4m.
Lake No. 10	Sec. 27 and 28, t. 52, r. 2, w5m.
Richmond Lake	Sec. 31, t. 58, r. 4, w5m.
Lake "C"	Sec. 14, t. 60, r. 5, w5m.
Buffalo Lake	T. 40 and 41, r. 20 and 21, w4m.
Little Island Lake	Sec. 8, t. 55, r. 5, w5m.
Mink Lake	T. 52, r. 2 and 3, w5m.
Crimson Lake	Sec. 24, t. 40, r. 8, w5m.
Hondo Lake	Sec. 13, t. 70, r. 1, w5m.
Conjuring Lake	T. 48, r. 7, w4m.
Cutbank Lake	Sec. 26, t. 72, r. 8, w6m.
Lake No. 2	S.E. ¼ sec. 6, t. 46, r. 3, w5m.

It is most gratifying to be able to report that the re-stocking of streams and the introduction of new species of trout into the waters of Alberta together with the transfer of perch into barren waters, or waters not previously containing this species, is showing greater evidence of success. The benefits that have already been and will continue to be obtained are most satisfactory. The introduction of Loch Leven trout into the tributaries of the Red Deer and the North Saskatchewan has proven very successful and many reports are now being received of excellent specimens being take in many of the streams and tributaries of these rivers. Most encouraging reports are also being received on the success of the introduction of rainbow trout into the streams in southern Alberta. This species continues to give the angler excellent sport.

Fishing at The Falls, north fork of the Oldman River, Southern Alberta



Falls, Bighill Creek, north of Cochrane

BIRD SANCTUARIES AND PUBLIC SHOOTING GROUNDS

No difficulties were experienced during the year in the enforcement of regulations governing bird sanctuaries and public shooting grounds and no infractions of these regulations were reported. The general public, apparently realizing the value of such areas, are most ready to co-operate.

Owing to the continued drought for several seasons the value of some of the sanctuaries has been greatly decreased. As the water areas in some of them and in several of the public shooting grounds have gone completely dry, they are of little or no value for water fowl at the present time. Efforts are being made to locate more suitable areas for sanctuaries in lieu of those which are in this condition. In order to combat the weed menace in these dried out areas it will be necessary to either dispose of the lands altogether or make some arrangement for cropping or grazing until such time as wet seasons restore the lakes to their former condition.

REGULATIONS APPERTAINING TO PLEASURE BOATS

Regulations appertaining to pleasure boats were enforced this year for the first time in the province. The fishery inspectors during the season made inspections and approved life saving devices and safety appliances on the 33 boats licensed for the purpose of carrying passengers. The system of inspection met the approval of the general public and co-operation of the operators was received in most cases without question, making it apparent that the carrying out of this measure was satisfactory to all concerned.

In order that the nuisance of open mufflers on motor boats be abated at the pleasure resorts, regulations were also effected for their control. Signalling equipment, safety fire appliances and proper life belts were required to be carried on boats and numbers of passengers were limited according to size of craft.

ITEMIZED REVENUE OBTAINED DURING FISCAL YEAR, 1934-35

Month	Fishermen's Licenses	Domestic Licenses	Commercial Licenses	Boat Licenses	Angling Permits	Sales	Sundry	Total
April	.....	.....	.....	.....	$ 8.00	$ 1.00	$ 16.66	$ 25.66
May	$1,040.00	$ 242.00	$ 160.00	$ 10.00	102.25	66.35	16.66	1,637.26
June	65.00	142.00	10.00	70.00	2,817.25	36.48	16.66	3,157.39
July	135.00	72.00	100.00	95.00	3,028.75	1.20	18.33	3,450.28
August	355.00	64.00	90.00	25.00	1,802.75	5.00	16.66	2,358.41
September	155.00	32.00	10.00	.....	873.75	77.02	16.66	1,164.43
October	45.00	14.00	.....	.....	1,118.00	1.70	16.66	1,195.36
November	305.00	14.00	.....	.....	345.50	76.10	16.66	757.26
December	1,020.00	464.00	20.00	.....	2.00	46.40	16.66	1,569.06
January	2,640.00	136.00	.....	.....	.....	12.26	16.66	2,804.92
February	265.00	106.00	10.00	.....	.....	79.50	72.49	532.99
March	255.00	10.00	.....	.....	.....	13.00	16.74	294.74
	$6,280.00	$1,296.00	$ 400.00	$ 200.00	$10,098.25	$ 416.01	$ 257.50	$18,947.76

Accounting Division

REPORT OF THE CHIEF ACCOUNTANT, I. N. McKINNON

A surplus of $646,528.97 on income account was shown for the fiscal year ending March 31, 1935, an increase of $171,840.78 over the previous year.

Revenue for the year was $1,169,496.15, an increase of $232,400.35. Expenditure was $522,967.18, an increase of $60,559.57.

Total cash received from all sources amounted to $1,337,394.04, particulars of which are given in statements "A" and "B".

Land Patents Branch

Homestead Entries.—Homestead entries granted were 2,780, covering approximately 444,800 acres. Details will be found in Statement "N".

Land Sales.—Collections on principal and interest were $9,780.68 and $3,379.76 respectively, an increase in principal of $1,785.15 and a decrease in interest of $1,455.13 from the previous year.

Details of collections for this branch are given under Statement "D".

Timber and Grazing Branch

Timber.—Receipts from timber operations amounted to $201,484.60, an increase of $70,955.46 over the previous year. This is mainly accounted for by a big increase in the number of railway ties cut. Full particulars of all timber cut on provincial lands will be found in the report of the Director of Forestry.

Grazing.—Receipts from grazing leases and permits were $43,345.35, an increase of $3,382.26 over the previous year. Leases in force number 3,380, covering an acreage of 3,078,446 acres.

Details of collections for this branch will be found under Statement "E".

Mining Lands Branch

Coal.—Rentals and fees on leases amounted to $129,260.84, an increase of $7,297.94. Royalties collected on coal mined on leases and sales were $174,538.69, a decrease of $17,688.85 from the previous year. It should be noted, however, that the figure for the previous year included royalty on an extra two months production due to a change in the system of royalty collections.

Coal produced subject to royalty on leases and sales totalled 2,934,338 tons, as against 2,703,736 for the previous year. Leases in force were 460, covering an area of 126,246.2 acres.

Petroleum and Natural Gas.—Collections of lease rentals, fees, etc., were $104,124.25, an increase of $22,585.73 over the previous year. Royalty collected was $61,265.88, a decrease of $12,282.39. Particulars of oil production will be found in the report of the Director of Petroleum and Natural Gas.

Leases in force numbered 3,344, covering an acreage of 785,656.7 acres.

Details of revenue collected by this branch are given in statement "F".

School Lands Branch

Sales.—No sales of school lands at public auction were held during the past fiscal year.

Collections of both principal and interest showed substantial increases, partly due, however, to the inclusion in this year's revenue, of proceeds from sale of the 1933 crop, which many farmers were unable to haul before March 31, 1934. Another reason for the increase may be ascribed to the action of the Department in taking on extra inspectors and collectors for a period of 3½ months in the Fall to make a survey of all sales and enforce collections where crop conditions warranted.

Principal collected was $80,132.43, an increase of $23,996.20. Interest amounted to $180,897.40, an increase of $90,125.15.

The bonus scheme whereby the Department credits an extra dollar for every dollar paid on current or arrears interest, is still in force.

The Alberta School Lands Trust Account as at March 31, 1935, amounted to $13,910,081.45, particulars of which will be found in statement "H".

Arrears interest on sales at March 31, 1935 was $1,333,378.58 as compared with $1,991,935.83 as at March 31, 1934, details of which are given in statement "I".

Cultivation and Grazing Permits.—Collections amounted to $74,993.35, an increase of $41,993.48 over the previous year, which was due, principally to an increase in the number of leases granted and also to the better prices received by the Department for its share of grain produced. Details will be found in statement "G".

Forestry Branch

Revenue collected from the various forest reserves amounted to $46,497.68, an increase of $3,053.87 over the previous year.

Details of receipts are given in statement "J".

Fisheries Branch

Collections amounted to $18,947.76 as compared with $15,071.61 for the previous year, an increase of $3,876.15.

Details of receipts will be found in statement "K".

The Mines Act Branch

Receipts for the year amounted to $6,538.64 as against $6,800.17 for the previous year.

Details of receipts are given in statement "L".

INDEX TO STATEMENTS

STATEMENT A.

STATEMENT OF CASH RECEIPTS BY BRANCHES

For Period April 1, 1934 to March 31, 1935

Land Patents Branch	$ 68,398.05
Timber and Grazing Branch	250,218.27
Mining Lands Branch	471,732.01
School Lands Branch	411,808.81
Forestry Branch	46,497.68
Fisheries Branch	18,947.76
Petroleum and Natural Gas Division	2,329.71
Administration of the Mines Act Branch	6,538.64
Administration Revenue (Miscellaneous Fees)	391.49
Tax Recovery Branch	12,520.36
Total Cash Receipts Allocated	$1,289,382.78
Unapplied receipts and monies subject to refund, carried forward from previous year	40,924.25
Suspense	7,087.01
TOTAL CASH RECEIPTS	$1,337,394.04

STATEMENT B.

STATEMENT OF CASH RECEIPTS FROM ALL SOURCES

From April 1, 1934 to March 31, 1935

	Gross Receipts	Refunds	Net Revenue
INCOME ACCOUNT:			
Homestead Fees	$ 27,840.00	$ 20.00	$ 27,820.00
Improvement Collection Fees	7,350.93	.....	7,350.93
Unclaimed Improvements	1,209.86	.....	1,209.86
Cancellation Fees	2,476.00	18.00	2,458.00
Filing Authority Fees	1,930.00	.....	1,930.00
General Sales Interest	3,379.76	.....	3,379.76
Cultivation Fees, Rentals, etc.	2,013.18	94.70	1,918.48
Surface Rentals	2,741.27	.....	2,741.27
Canmore Rental Account	644.92	.....	644.92
Land Patents Sundry	5,027.05	86.85	4,940.20
Fur Farm Fees and Rentals	225.00	50.00	175.00
Timber Permits, Fees, Dues, etc.	227,081.10	2,017.93	225,063.17
Grazing Fees, Rentals, etc.	58,184.07	3,406.51	54,777.56
Hay Permits, Fees, Dues, etc.	4,220.44	367.50	3,852.94
Timber and Grazing Miscellaneous	2,400.28	.....	2,400.28
Coal Mines Act Sundry Revenue	4,439.90	37.15	4,402.75
Coal Fees, Rentals, etc.	129,775.84	1,293.03	128,482.81
Coal Royalties	176,122.43	.....	176,122.43
Petroleum and Natural Gas Fees, Rentals, etc.	104,960.64	679.75	104,280.89
Petroleum and Natural Gas Royalties	61,265.88	.....	61,265.88
Petroleum and Natural Gas Drilling Permits	100.00	5.00	95.00
Quarrying Lease Fees and Rentals	1,213.38	7.00	1,206.38
Mining Lands Sundry Revenue	1,440.54	.....	1,440.54
Fishing Licenses	7,976.00	.....	7,976.00
Boat Licenses	200.00	.....	200.00
Angling Permits	11,164.75	.....	11,164.75
Fisheries Sundry Revenue	673.51	64.37	609.14
Administration Sundry Revenue	391.49	1.05	390.44
School Lands Sales Interest	180,897.40	391.82	180,505.58
School Lands Miscellaneous	157,341.10	10,059.32	147,281.78
Reimbursement of Salaries and Expenses	381.75	.....	381.75
Turner Valley Gas Conservation Board	900.00	34.13	865.87
Tax Recovery Office Fees	1,696.25	25.00	1,671.25
Services and Supplies	490.54	.....	490.54
TOTAL INCOME ACCOUNT	$1,188,155.26	$ 18,659.11	$1,169,496.15
CAPITAL ACCOUNT:			
Land Sales, Principal	9,780.68	15.48	9,765.20
TOTAL INCOME AND CAPITAL ACCOUNTS	$1,197,935.94	$ 18,674.59	$1,179,261.35
UNAPPLIED RECEIPTS CARRIED FORWARD: (Subject to Refund)			
Improvements	21,242.97	7,770.48	13,472.49
Suspense	16,544.34	.....	16,544.34
School Lands Cultivation Crop Shares	10,000.00	.....	10,000.00
Land Patents Cultivation Crop Shares	300.00	.....	300.00
	$1,246,023.25	$ 26,445.07	$1,219,578.18
TRUST ACCOUNTS:			
School Lands Trust Fund	80,132.43		
Homesteaders' Trust Monies	414.25		
Tax Recovery Lands Trust Account	10,824.11		
TOTAL CASH RECEIPTS	$1,337,394.04		

STATEMENT C.

STATEMENT OF CASH RECEIPTS BY AGENCIES

April 1, 1934 to March 31, 1935

	Land Patents Branch	Timber and Grazing Branch	Mining Lands Branch	School Lands Branch	Tax Recovery Branch	Total
Edmonton	$ 35,171.04	$184,286.58	$130,210.11	$187,832.39	$ 656.02	$ 538,156.14
Calgary	9,880.39	30,355.45	250,478.06	127,978.75	822.97	419,515.62
Lethbridge	9,524.35	26,498.19	90,344.01	59,242.94	10,892.18	196,501.67
Peace River	13,822.27	9,078.05	699.83	36,754.73	149.19	60,504.07
	$ 68,398.05	$250,218.27	$471,732.01	$411,808.81	$ 12,520.36	$1,214,677.50

N.B.—Moneys which were paid direct to Administration Office have been allocated to the Agency concerned.

STATEMENT D.

LAND PATENTS BRANCH
STATEMENT OF CASH RECEIPTS

April 1, 1934 to March 31, 1935

	Edmonton	Calgary	Lethbridge	Peace River	Total
Homestead Fees	$17,310.00	$ 3,370.00	$ 1,160.00	$ 6,000.00	$27,840.00
Improvements	7,342.52	409.50	2,275.00	5,350.34	15,377.36
Cancellation Fees	1,696.00	126.00	22.00	632.00	2,476.00
Filing Authority Fees	1,028.00	256.00	158.00	488.00	1,930.00
General Sales: Principal	4,269.61	2,592.91	2,406.51	511.65	9,780.68
General Sales: Interest	1,450.06	109.17	1,216.95	603.58	3,379.76
Cultivation Fees, Rentals, etc.	73.52	583.72	1,177.54	.....	1,834.78
Surface Rentals	1.00	238.38	125.70	.....	365.08
Canmore Rental Account	.....	644.92	.....	.....	644.92
Land Patents Miscellaneous	1,431.55	1,549.79	962.18	186.70	4,130.22
Homesteaders' Trust Monies	393.78	.....	20.47	.....	414.25
Fur Farm Fees and Rentals	175.00	.....	.....	50.00	225.00
	$35,171.04	$ 9,880.39	$ 9,524.35	$13,822.27	$68,398.05

N.B.—Moneys which were paid direct to Administration Office have been allocated to the Agency concerned.

STATEMENT E.

TIMBER AND GRAZING BRANCH
STATEMENT OF CASH RECEIPTS

April 1, 1934 to March 31, 1935

	Edmonton	Calgary	Lethbridge	Peace River	Total
Timber: Fees, Dues, Royalty, etc.	$177,895.19	$16,518.35	$ 30.75	$ 7,040.31	$201,484.60
Grazing: Fees, Rentals, etc.	2,858.18	12,734.41	26,461.94	1,290.82	43,345.35
Hay: Fees, Dues, etc.	2,337.19	851.03	5.50	746.92	3,940.64
Timber and Grazing Miscellaneous	1,196.02	251.66	.....	.....	1,447.68
	$184,286.58	$30,355.45	$26,498.19	$ 9,078.05	$250,218.27

N.B.—Moneys which were paid direct to Administration Office have been allocated to the Agency concerned.

STATEMENT F.

MINING LANDS BRANCH
STATEMENT OF CASH RECEIPTS

April 1, 1934 to March 31, 1935

	Edmonton	Calgary	Lethbridge	Peace River	Total
Coal Fees, Rentals, etc.	$ 59,503.48	$ 55,705.16	$13,728.18	$ 324.02	$129,260.84
Coal Royalty	56,161.78	65,856.30	52,339.76	180.85	174,538.69
Petroleum and Natural Gas: Fees, Rentals, etc.	12,873.19	68,684.88	22,511.18	55.00	104,124.25
Petroleum and Natural Gas: Royalties	482.42	59,319.34	1,464.12	.....	61,265.88
Quarrying Fees, Rentals, etc.	357.99	686.88	48.55	119.96	1,213.38
Mining Lands Miscellaneous	831.25	225.50	252.22	20.00	1,328.97
	$130,210.11	$250,478.06	$90,344.01	$ 699.83	$471,732.01

N.B.—Moneys which were paid direct to Administration Office have been allocated to the Agency concerned.

STATEMENT G.

SCHOOL LANDS BRANCH

STATEMENT OF CASH RECEIPTS

April 1, 1934 to March 31, 1935

	Edmonton	Calgary	Lethbridge	Peace River	Total
Sales: Principal	$ 40,596.35	$ 25,655.10	$ 7,695.74	$ 6,185.24	$ 80,132.43
Sales: Interest	88,504.25	49,791.73	21,853.92	20,747.50	180,897.40
Cultivation Fees, Rentals, etc.	37,244.91	24,189.00	5,827.29	7,732.15	74,993.35
License of Occupation and Special Leases	38.12	73.80	34.51	15.00	161.43
Timber Permits, Fees, Dues, etc.	11,529.49	921.91	8.00	340.66	12,800.06
Grazing Fees, Rentals, etc.	6,809.58	10,983.78	10,298.10	1,518.81	29,610.27
Hay Fees, Dues, etc.	811.84	245.10	4.25	225.37	1,286.56
Coal Fees, Rentals, etc.	84.00Dr.	3,220.92	2,174.00	.....	5,310.92
Coal Mining Royalties	.....	3,606.02	8,759.37	.....	12,365.39
Petroleum and Natural Gas: Fees, Rentals, etc.	2,126.40	9,068.07	2,486.26	.....	13,680.73
Petroleum and Natural Gas: Royalties	141.25	141.83	.....	.....	283.08
Miscellaneous	114.20	81.49	101.50	10.00 Dr.	287.19
	$187,832.39	$127,978.75	$59,242.94	$36,754.73	$411,808.81

N.B.—Moneys which were paid direct to Administration Office have been allocated to the Agency concerned.

STATEMENT H.

ALBERTA SCHOOL LANDS TRUST FUND

BALANCE SHEET—MARCH 31, 1935

ASSETS

Cash in Bank and on Hand		$ 20,190.05	
Investments:			
Dominion of Canada Debentures		9,798,035.45	
Accounts Receivable:			
Provincial Treasurer Income Account	$ 14,779.39		
Undue Principal	2,383,728.42		
Arrears Principal	1,693,357.18		
		4,091,864.99	
			$13,910,090.49

LIABILITIES

Alberta School Lands Trust Account	$13,910,081.45	
Suspense	9.04	
		$13,910,090.49

STATEMENT I.

ALBERTA SCHOOL LANDS SALES

REVENUE ACCOUNT

For the Period April 1, 1934 to March 31, 1935

Arrears Interest as at March 31, 1934	$1,991,935.83	
Interest charged	436,636.79	
Previous Year Refunds	58.05	
Revenue Collections		$ 180,505.58
Interest Bonus granted		173,716.66
Interest on Cancelled Sales written off		741,029.85
Arrears Interest as at March 31, 1935		1,333,378.58
	$2,428,630.67	$2,428,630.67

STATEMENT J.

FORESTRY SERVICE

STATEMENT OF CASH RECEIPTS FROM FOREST RESERVES

April 1, 1934 to March 31, 1935

LAND PATENTS BRANCH:	
Surface Rentals	$ 2,376.19
Miscellaneous Use Permits	896.83
TIMBER AND GRAZING BRANCH:	
Timber Fees, Dues, etc.	25,596.50
Grazing Fees, Rentals, etc.	14,838.72
Hay Fees, Dues, etc.	279.80
Timber and Grazing Miscellaneous	952.60
MISCELLANEOUS:	
Services and Supplies	490.54
FISHERIES BRANCH:	
Angling Permits	1,066.50
	$46,497.68

STATEMENT K.

FISHERIES BRANCH
STATEMENT OF CASH RECEIPTS
April 1, 1934 to March 31, 1935

Angling Permits	$10,098.25
Fishing Licenses	7,976.00
Boat Licenses	200.00
Miscellaneous	673.51
	$18,947.76

STATEMENT L.

ADMINISTRATION OF THE MINES ACT BRANCH
STATEMENT OF CASH RECEIPTS
April 1, 1934 to March 31, 1935

Certificate Fees	$ 1,141.65
Sale of Report Books	1,042.75
Coal Sales Act, Registration Fees	32.00
Coal Leases (Road Allowance) Rental	515.00
Coal Leases (Road Allowance) Royalty	1,583.74
Examination Fees	969.00
Miscellaneous	1,254.50
	$ 6,538.64

STATEMENT M.

STATEMENT OF COLLECTIONS ON TAX RECOVERY LANDS
April 1, 1934 to March 31, 1935

Improvements	$ 732.00
Cultivation Permits	239.10
Cultivation Rentals, etc.	559.47
Cultivation Crop Shares	3,365.66
Miscellaneous Rentals	215.09
Grazing Permits	2,835.32
Grazing Rentals, etc.	1,914.20
Timber Permits	76.68
Hay Permits	28.50
Sales, Principal	858.09
	$10,824.11
Office Fees	1,696.25
	$12,520.36

STATEMENT N.

HOMESTEAD ENTRIES GRANTED
April 1, 1934 to March 31, 1935

	Homesteads	Second Homesteads	Soldier Grants	Total	Entries to Women
Edmonton Land Agency	1,536	177	18	1,731	473
Calgary Land Agency	266	67	4	337	87
Lethbridge Land Agency	61	52	3	116	31
Peace River Land Agency	562	29	5	596	244
	2,425	325	30	2,780	835